a-dec®

INSTRUCTION MANUAL

2601 CRESTVIEW DRIVE • POST OFFICE BOX 111 • NEWBERG, OREGON 97132 USA • TELEPHONE 503/538-7478

a-dec

Operation and Maintenance Instructions

Pac I (portable)
Model 3420

Warranty

A-dec™ warrants all products in this catalog against defects in material or workmanship for one year from time of delivery. A-dec's sole obligation under the warranty is to provide parts for the repair, or at its option, to provide the replacement product (excluding labor). The buyer shall have no other remedy. All special, incidental, and coincidental damages are excluded.

Written notice of breach of warranty must be given to A-dec within the warranty period. The warranty does not cover damage resulting from improper installation or maintenance, accident or misuse. The warranty does not cover damage resulting from the use of cleaning, disinfecting or sterilization chemicals and processes. The warranty also does not cover light bulbs. Failure to follow instructions provided in the A-dec Owner's Guide (operation and maintenance instructions) may void the warranty.

A-dec warrants A-dec dental chair cylinders, both lift and tilt, for ten years from the date of purchase of the chair or the cylinder. This warranty is retroactive to A-dec chair cylinders already in the field. The warranty covers chair cylinders A-dec finds to have manufacturing related irregularities. Stool cylinders are covered under A-dec's one-year warranty.

No other warranties as to merchantability or otherwise are made.

How to Use this Manual

This manual describes your PAC I Portable Delivery System, Model 3420

Your manual is divided into three sections: Set-up and repacking, operation, and maintenance. Each section addresses specific information, and the following list of questions should help you determine which section to check when you need information.

Section 1	Set-up and repacking	The unit just arrived, how do I set it up? How do I repack the Field unit for transportation or storage?
Section 2	Operation	How do I operate it? What do the controls do? How do I make routine adjustments? What do the accessories do? How do I clean it?
Section 3	Maintenance	How does the unit work? What are the major components? Something is wrong, how can I fix it?

We understand that you may be using this portable dental delivery system virtually anywhere. For this reason, we have made the *Maintenance* section quite comprehensive. If you have questions after reading the appropriate section(s), contact your authorized A–dec dealer.

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Setup Instructions for Field and Institutional Pac I

Follow the instructions for your model.

Institutional Unit

Assemble the U-Frame

Using a 1/4" hex key, attach the upright support to the U-frame with the 1-1/4" (32 mm) long socket-head screw (see Figure 1).

Mount the Institutional Unit Control Head

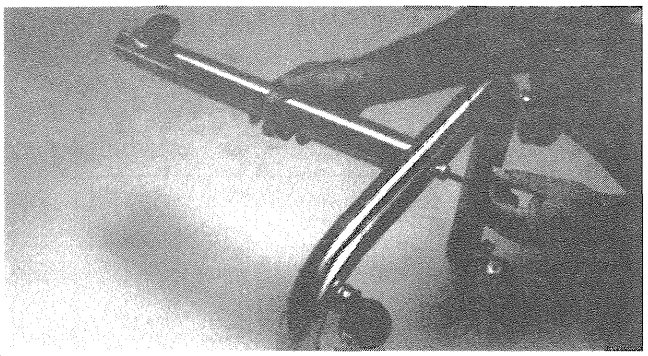


Figure 1. Assemble the u-frame.

1. Align the control head mounting hub with the U-frame upright support and place the control head on the upright support (see Figure 2).
2. Using a 5/32" hex key, tighten the setscrew in the control head hub (see Figure 3).

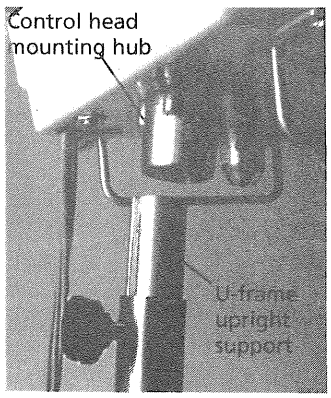


Figure 2. Mount the control head.

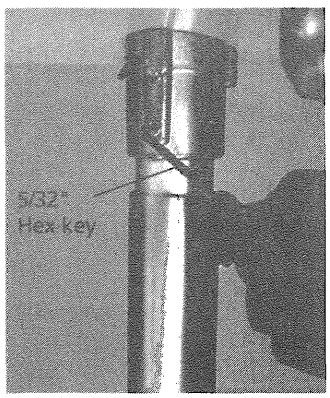


Figure 3. Tighten the setscrew.

3. Place the foot control where desired.

Go to Place the Handpiece Tubings and Syringe in the Holders.

Field Unit

Assemble the Tripod Base

1. Remove the foot control and place it on top of the control head (see Figure. 4).

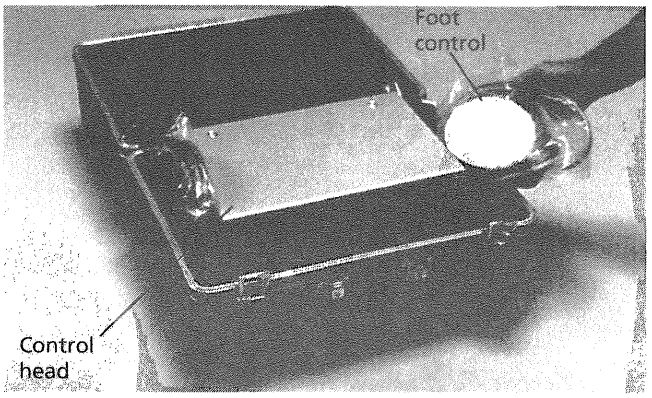


Figure 4. Remove the foot control.

2. Remove the supply air tubing (see Figure 5) and set it aside.

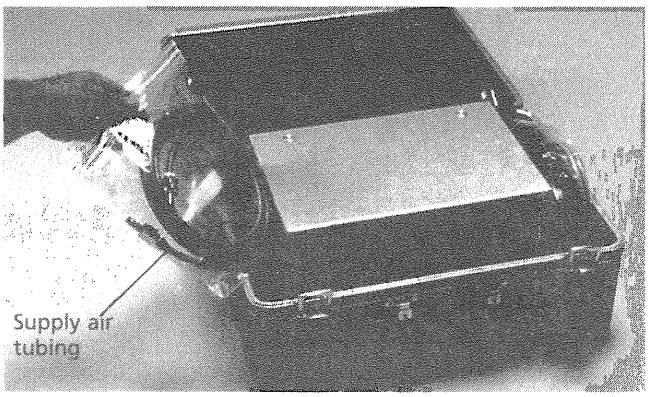
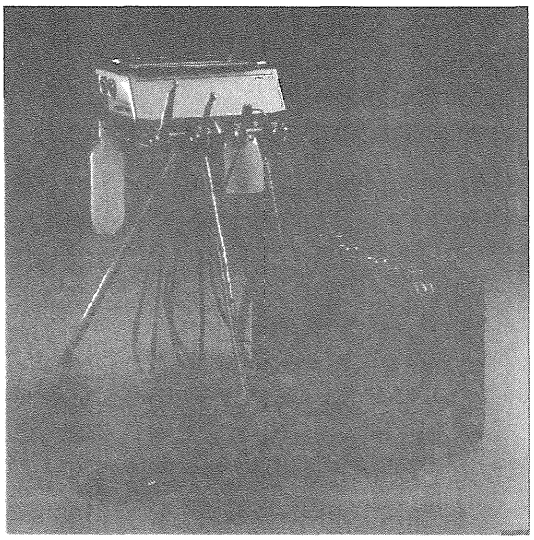


Figure 5. Remove the supply air tubing.

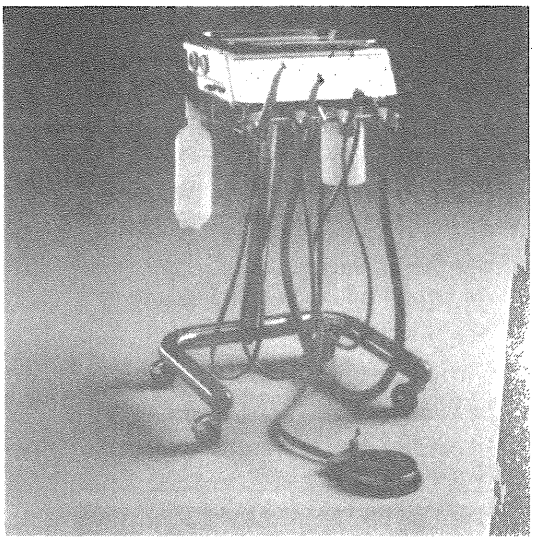
3. Unsnap the divider to access the other side of the case.

Pac I (Portable)

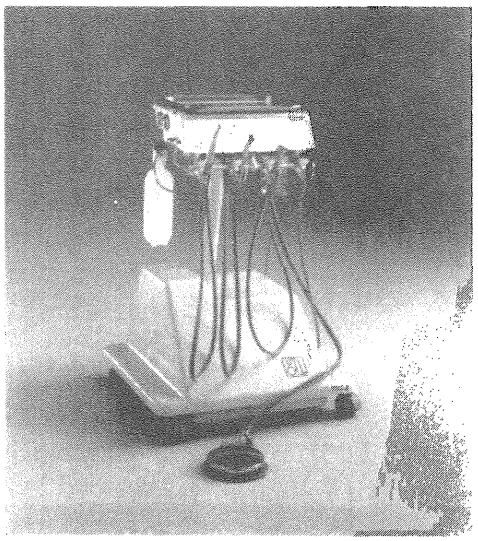
Model 3420



Pac 1 Field Unit



Pac 1 Institutional Unit



Pac 1 Self-Contained Unit

4. If your unit is equipped with the (optional) second tray holder and tray (see Figure 6), remove them and set aside.

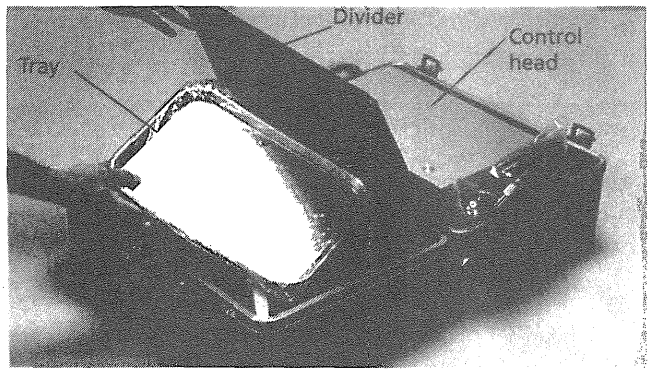


Figure 6. Remove the (optional) second tray and tray holder.

5. Remove the tripod and the tripod mounting bolt assembly (see Figure 7).

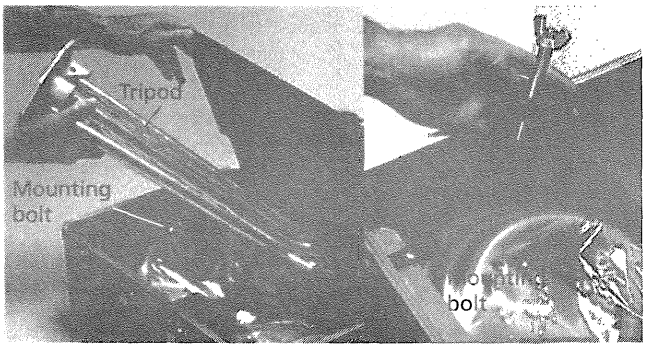


Figure 7. Remove the tripod and mounting bolt.

6. Adjust the tripod legs to the desired height (see Figure 8). We recommend the highest setting for setup.

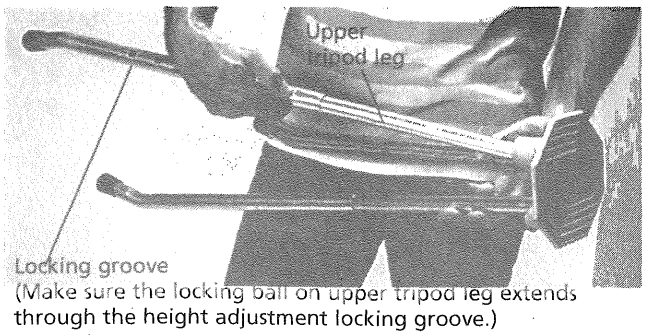

Upper tripod leg
Locking groove
(Make sure the locking ball on upper tripod leg extends through the height adjustment locking groove.)

Figure 8. Adjust the tripod legs.

7. Insert the mounting bolt up through the slot in the bottom of the tripod (see Figure 9). Secure the bolt to the tripod by turning it 90°.

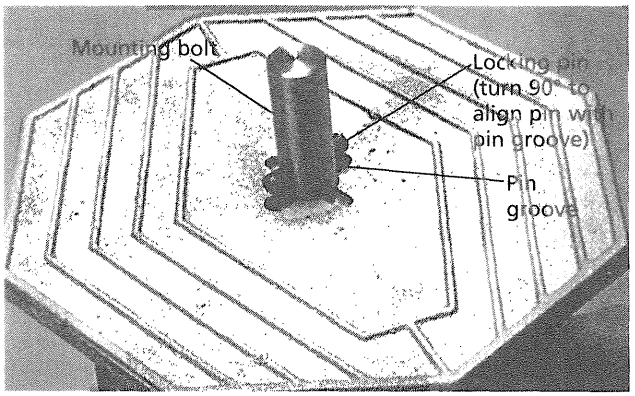


Figure 9. Install the mounting bolt.

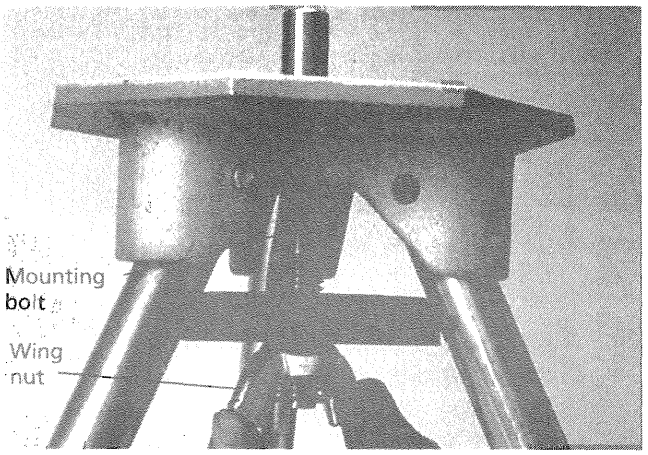


Figure 10. Tighten the wing nut

Tighten the wing nut (see Figure 10).

Mount the Field Unit Control Head

1. Remove the control head and foot control from the case, then place the mounting hub of

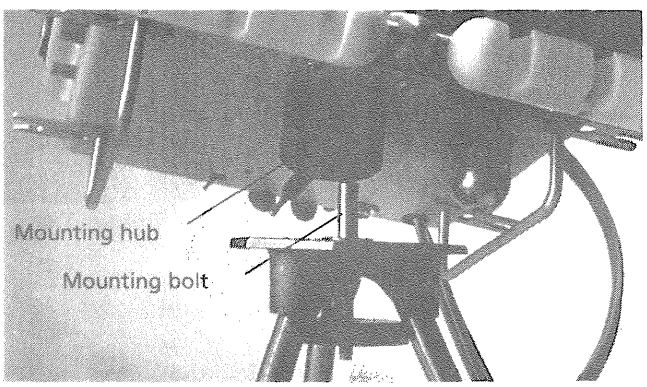


Figure 11. Mount the control head.

the control head on the mounting bolt (see Figure 11).

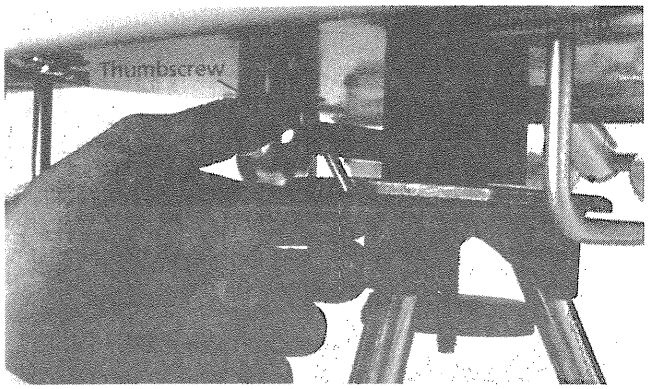


Figure 12. Tighten the thumbscrew

2. Tighten the mounting hub thumbscrew (see Figure 12).

Go to Place the Handpiece Tubing and Syringe in the Holders.

Place the Handpiece Tubings and Syringe in the Holders

1. Lift the control head cover.
2. Remove the two handpiece tubings and the syringe, then place them in the holders (see Figure 13).

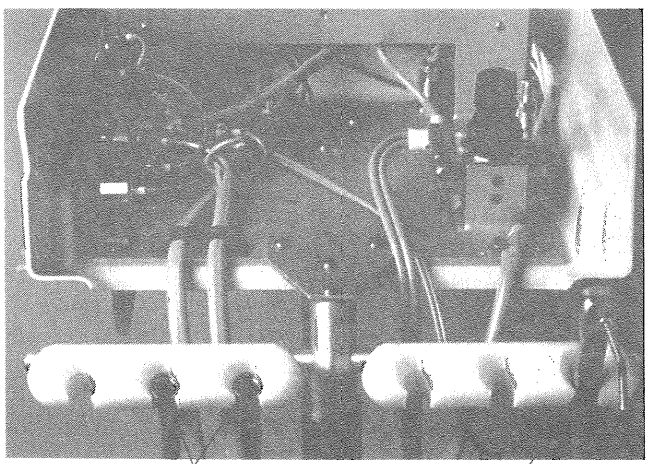


Figure 13. Place the handpiece tubings and the syringe in the holders.

Install the Self-contained Water Bottle

17. Install the water bottle on the left hanger below the controls (see Figure 14).

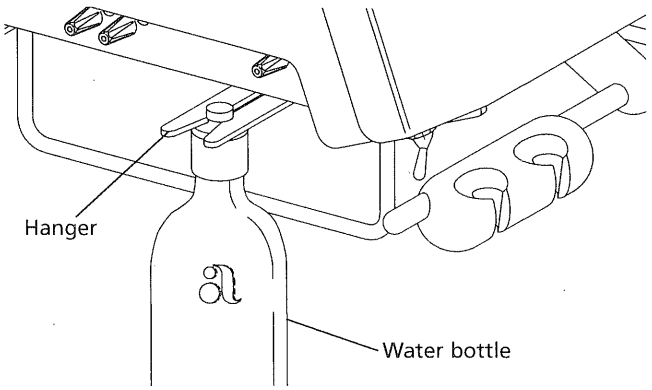


Figure 14. Install the water bottle.

Install the Steril-Vac

Remove the Steril-Vac assembly from the case and hang it on the right rear hanger (see Figure 15). Place the Steril-Vac handpiece in a holder. Route the supply air tubing from the control and connect the quick disconnect to the Steril-Vac container.

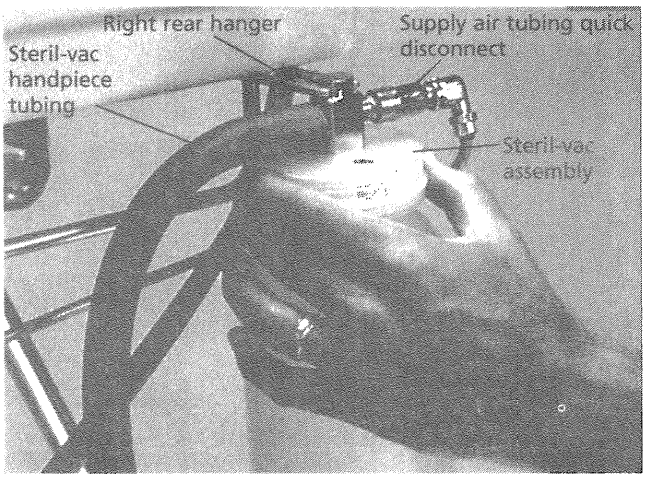


Figure 15. Install the Steril-Vac assembly on the hanger.

Install the Optional Air Saliva Ejector (ASE)

Remove the optional ASE from the case. Place the ASE handpiece in a holder. Connect the container to the remaining supply air tubing quick disconnect, then mount the container on the right front hanger.

Install the Tray Holder

1. Remove one of the plugs from the control head cover (see Figure 16). Install the tray holder as shown in Figure 17.

   If the unit is equipped with an optional second tray holder, remove the remaining plug from the control head cover and install the second tray holder.
2. Place the tray(s) on the tray holder(s).

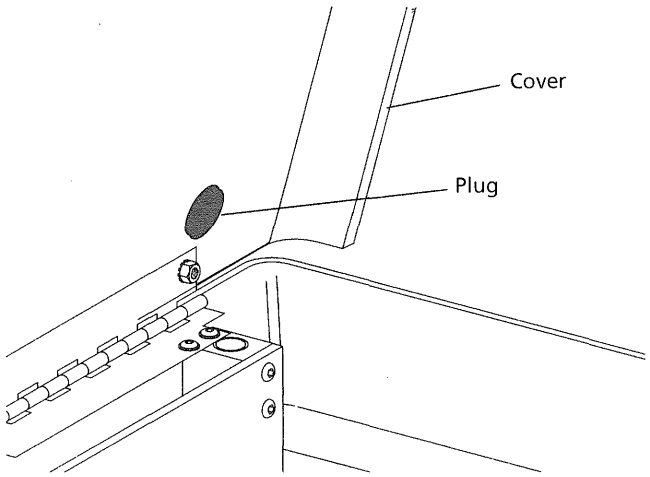


Figure 16. Remove the plug.from the cover.

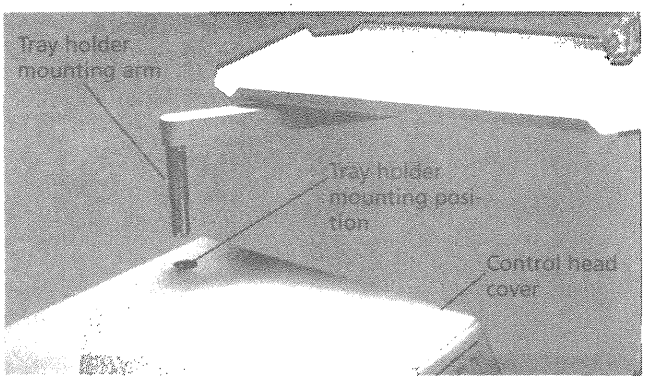


Figure 17. Install the tray holder.

Connect the Supply Air Tubing

Attach the supply air tubing male quick disconnect (QD) with automatic shutoff (see Figure 18) to the female QD at the bottom rear of the control head (see Figure 19).

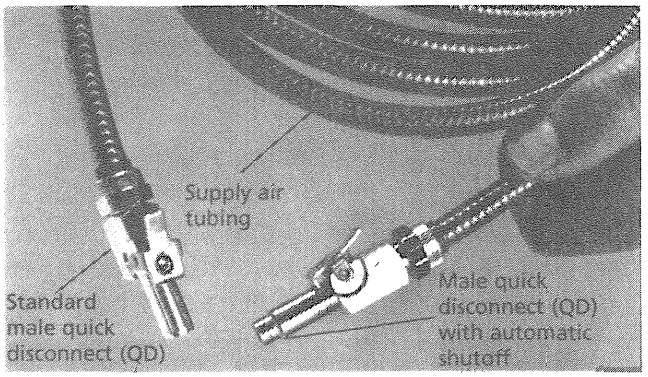


Figure 18. The supply air tubing is shown above.

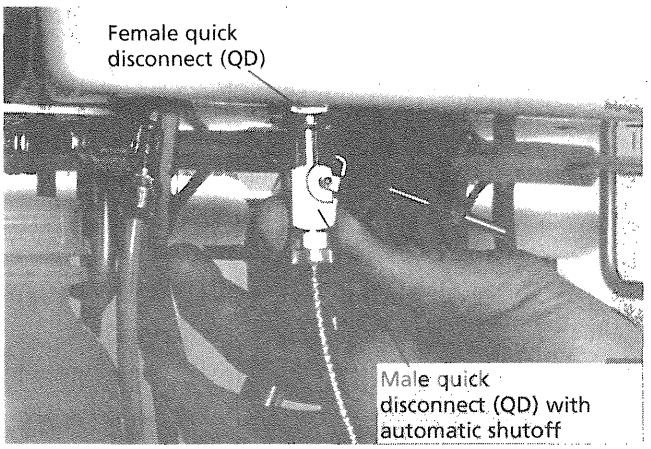


Figure 19. Attach the supply air tubing.

Pac I Field Repair Kit and (Optional) Tool Kit

There should be a field repair kit remaining in your carrying case or box (see Figure 20).

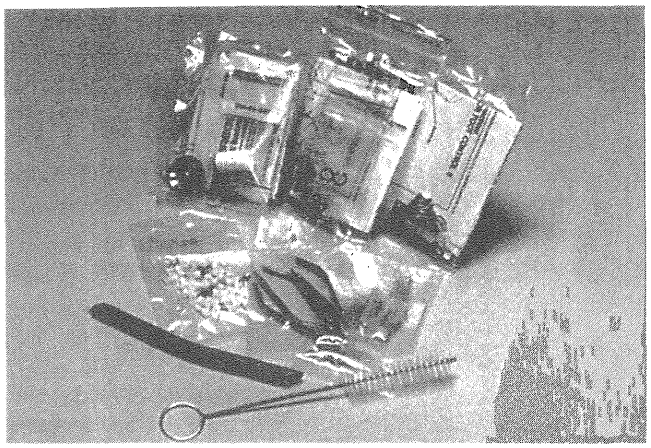


Figure 20. Field Repair Kit

There is also a tool kit (see Figure 21) with your Field Unit, an option for Institutional and Self-Contained Units.

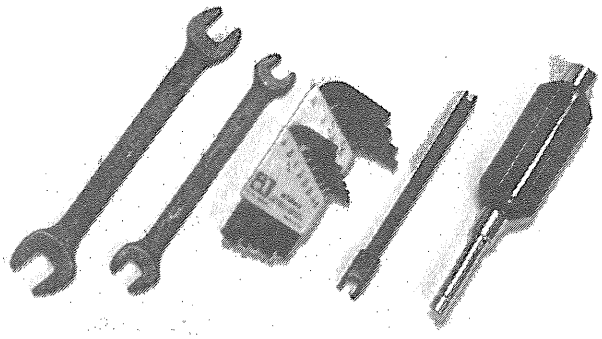


Figure 21. Tool kit

Refer to Pac I Tool and Repair Kits for a complete listing of the items in these kits.

Testing Your Pac I Unit

1. Fill the self-contained water bottle with treatment water (refer to Treatment Water), then screw the bottle into the cap.
2. Self-Contained Units —
   Plug the unit into a power outlet.
   Field and Institutional Units —
   Connect the supply air tubing to a dry, filtered air source delivering 80-100 psi (552–690 kPa) of air at 4 cfm.
   The supply air pressurizes your unit; in effect, turning it on.
3. Carefully check the unit and accessories for air or water leaks.
4. If the unit is equipped with the optional 17-watt power supply (only for use with A-dec single voltage intraoral light source), plug the power supply in now.
5. Attach the handpieces. Your Pac I is ready for operation.

Repacking the Pac I Field Unit

1. Unplug the unit.
2. Field and Institutional Units — Disconnect the supply air tubing from the air source.
3. Thoroughly clean the entire unit and accessories using the instructions in the following sections:
   - Syringe and Tip Asepsis
   - Self-Contained Water Asepsis
   - Steril-Vac Cleaning
4. Reverse the setup instructions.

> **NOTE**
>
> The standard tray holder and tray are packed face down with the mounting arm against the back of the case. The optional second tray holder and tray are packed face up with the arm positioned in the corner of the case.

About Your PAC 1 Dental Unit

Your A-dec PAC I dental unit is engineered to provide many years service, while requiring a minimum amount of attention. However, a certain amount of care is required. Conscientious adherence to these instructions will ensure reliable service from your Pac I.

The Pac I is a portable dental unit designed for field or operatory use. All facilities required for the practice of general dentistry are provided for both the doctor and the dental assistant.

The only external connection required isthe supply air. A 10' (3 m) supply air hose is provided for this purpose. It may be connected to a compressor delivering, dry filtered air at 80-100 psi (552-690 kPa) at 4 cfm, or to bottled gas (carbon dioxide or nitrogen) regulated to 80-100 psi (552-690 kPa).

Pac I is offered in three configurations:

- Field Unit,
- Institutional Unit, and
- Self-Contained Unit.

The Field Unit (see Figure 22A) includes a carrying case and a vertically adjustable tripod base. The top of the control head is adjustable between 26" (66 cm) and 32-1/2" (82.5 cm) from the floor.

The control head and accessories can be quickly disassembled from the base, and the entire Field Unit can be repacked into its carrying case for safe transportation or storage. The Field Unit, including carrying case and all accessories weighs 35 lbs (15.5 kg).

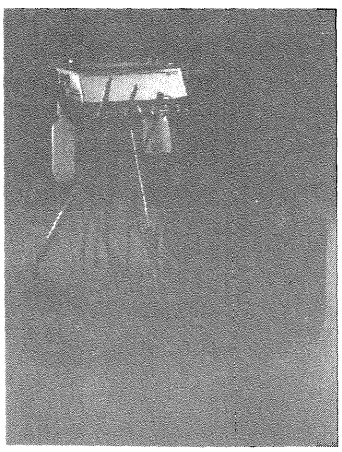


Figure 22A. Field Unit

The Institutional Unit (see Figure 22B) includes an adjustable height mobile U-frame base and (optional) foot control carrier. The U-frame base has a 10-1/2" (27 cm) vertical adjustment, and is infinitely adjustable within its range. The top of the control head is adjustable between 27-1/2" (70 cm) and 38" (97 cm) from the floor.

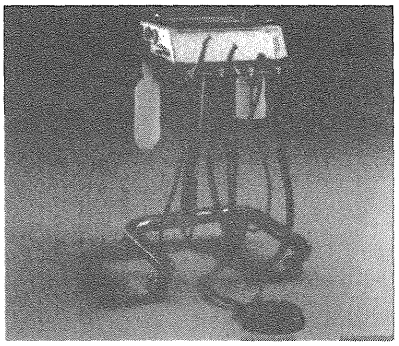


Figure 22B. Institutional Unit

The Self-contained Unit (see Figure 22C) includes a fixed height mobile stand, a built-in compressor, and a duplex electrical outlet. The top of the control head is at a height of 33" (84 cm) from the floor.

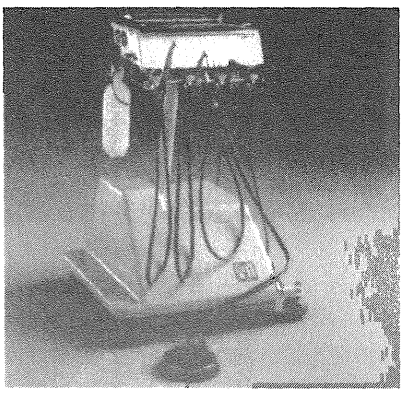


Figure 22C. Self-Contained Unit

All PAC I Units include a Field Repair Kit (see Figure 23). Field Units also includes a Tool Kit (optional for Institutional and Self-Contained Units). For a complete listing of the items in the kits, refer to PAC 1 Tool and Repair Kits.

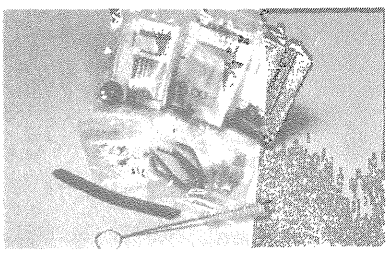


Figure 23. Field repair kit

Control Functions

Unit On/Off. To turn your Pac I unit ON, simply connect the unit supply air tubing (see Figure 18) to the compressor or bottled gas (refer to *About Your Pac I).*

To turn the unit OFF, disconnect the unit from the compressor or bottled gas.

Handpiece Selector (see Figure 24) controls which one of the two handpieces will be operated when you press the foot control disc.

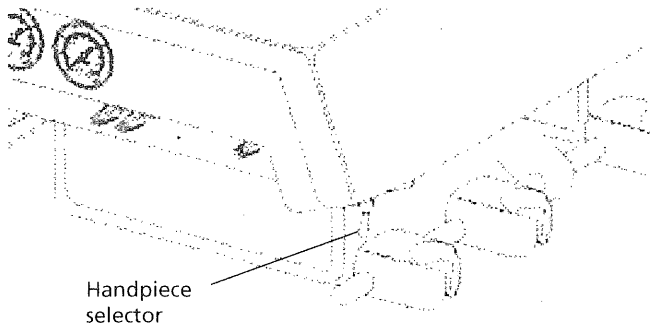


Figure 24. Handpiece selector

Drive Air Pressure Flow Controls (see Figure 25)are used to adjust the drive air pressure to each handpiece. To adjust drive air pressure, refer to Routine Adjustments, Drive Air Pressure.

Coolant Air Flow Control (see Figure 25) adjusts the flow of coolant air to both handpieces. Turned fully clockwise, it completely shuts off the coolant air. To adjust coolant air flow, refer to Routine Adjustments, Handpiece Coolant Air Flow.

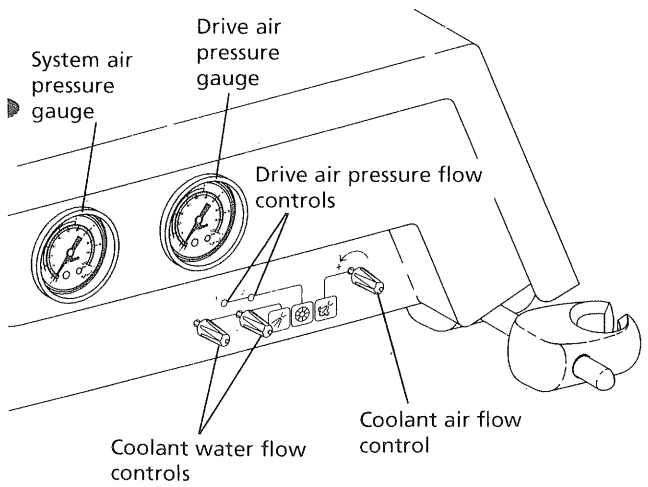


Figure 25. Pac I handpiece controls

Coolant Water Flow Controls (see Figure 25) are used to adjust the flow of coolant water to each handpiece. To adjust coolant water flow, refer to *Routine Adjustments, Handpiece Coolant Water Flow.*

Air Pressure Gauges

System Air Pressure Gauge (see Figure 25) displays air pressure coming from the air filter/ regulator. The reading should be 70–80 psi (483–552 Kpa).To adjust the system pressure, refer to *Routine Adjustments, System Air Pressure.*

Drive Air Pressure Gauge (see Figure 25) displays drive air pressure to the selected handpiece. Use this gauge to adjust the drive air pressure to the handpiece manufacturer's specifications, as described in *Routine Adjustments, Drive Air Pressure.*

Foot Control

The foot control (see Figure 26) modulates drive air to the active handpiece and provides air signal that activates the coolant air and coolant water flow. The foot control is operated by light foot pressure applied to any part of the foot control disc.

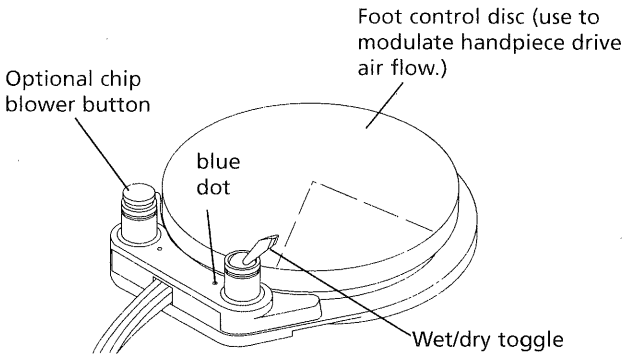


Figure 26. Foot Control

Wet/Dry Toggle (see Figure 26) allows you to shut off coolant water to the handpieces without moving your hands from the oral cavity. Using your foot, move the toggle away from the blue dot to turn coolant water off. Move the toggle toward the blue dot to turn coolant water on.

Optional Chip Blower Button (see Figure 26) sends a jet of air through the handpiece when it is not running.

Routine Adjustments

System Air Pressure

The air filter/regulator (see Figure 27) controls the system air pressure and is preset to 80 psi (552 kPa). If the system pressure is not 80 psi (552 kPa), simply lift the adjustment knob and turn clockwise to increase pressure and turn counterclockwise to decrease pressure. When adjusting to decrease pressure, press the syringe air button before reading the gauge.

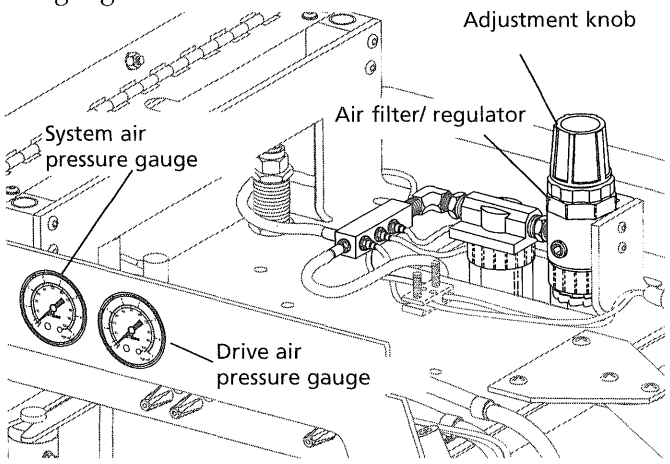


Figure 27. Adjust the system air pressure.

Handpiece Drive Air Pressure

Adjust the drive air pressure to meet the handpiece manufacturer's dynamic drive air pressure specification. Refer to the documentation that came with your handpiece for the dynamic drive air pressure specification.

You will need a 3/32" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the drive air pressure gauge (see Figure 27) and the drive air pressure control (see Figure 25).
3. Move the wet/dry toggle on the foot control to the OFF position, away from the blue dot (see Figure 26).
4. Turn the drive air pressure flow control clockwise until the valve seats.
5. Fully depress the foot control disc.
6. While running the handpiece, watch the drive air pressure gauge and adjust the handpiece drive air pressure.
   - Turn the drive air control counterclockwise to increase drive air pressure flow.
   - Turn the control clockwise to decrease flow.
7. Repeat steps 1 through 6 for each handpiece.

Handpiece Coolant Air Flow

The coolant air flow control is used to adjust the coolant air flow to all handpieces.

You will need an adjustment key or a 1/8" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the coolant air flow control (see Figure 25).
3. Move the wet/dry toggle on the foot control to the OFF position, away from the blue dot (see Figure 26).
4. Insert an adjustment key, or a 1/8" hex key, into the coolant air flow control.
5. Fully depress the foot control disc to activate the handpiece.
6. Adjust the coolant air flow to fit your needs. A strong flow of air is recommended.
   - Turn the control clockwise to decrease the flow or counterclockwise to increase the flow.
7. The coolant air is set for all handpieces.

Handpiece Coolant Water Flow

The coolant water flow controls are used to adjust the flow of coolant water to each handpiece.

You will need an adjustment key or a 1/8" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the coolant water flow controls (see Figure 25).
3. Move the wet/dry toggle on the foot control to the On position, toward the blue dot (see Figure 26).
4. Insert an adjustment key, or a 1/8" hex key, into the coolant water flow control for the handpiece being adjusted.
5. Hold the handpiece over a receptacle. Be sure to hold the handpiece so that the water will be directed away from you and into the receptacle. Then, fully depress the foot control disc to activate the handpiece.
6. Adjust the coolant water flow to fit your needs.
   - Turn the control clockwise to decrease the flow or counterclockwise to increase the flow.
7. Repeat steps 1 through 6 for each handpiece.

Autoclavable Syringe

Your syringe is designed to be easily serviced in the operatory. The syringe parts subject to wear under normal use are provided in a syringe repair kit which is located in the field repair kit. Repair instructions can be found in the Maintenance section of this manual.

Autoclavable Syringe Operation

1. Make sure the unit is on.
2. Insert a syringe tip into the syringe tip retainer (refer to Changing the Syringe Tip).
3. Air — Depress the right button.
4. Water — Depress the left button.
5. Spray — Depress both buttons.

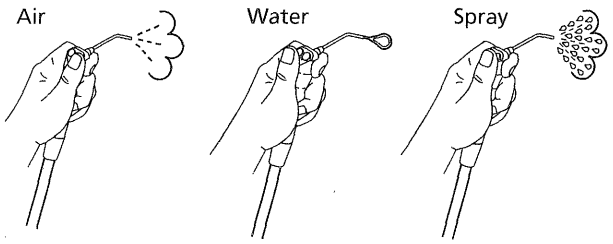


Figure 28. Adjust the syringe air and water flows.

Syringe Flow Adjustment

The syringe air and water flow are controlled by a dual pinch valve located inside the control head (see Figure 28). To identify which adjustment screw controls the air flow and which controls the water flow, follow each length of tubing through the dual pinch valve.The syringe air tubing is connected to the air filter regulator manifold and the syringe water tubing is connected to the red tubing inside the control head.

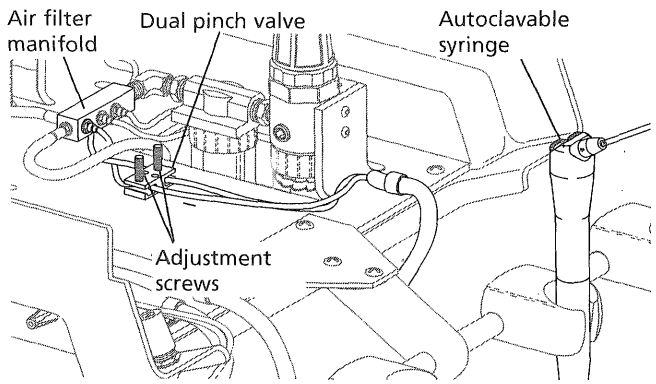


Figure 29. Adjust the system air pressure.

1. Adjust the water to achieve the desired rate of flow. Press the left (water) button (see Figure 29), then turn the water flow adjustment screw.
   - Turn the adjustment screw clockwise (in) to decrease water flow.
   - Turn the adjustment screw counterclockwise (out) to increase water flow.
2. Press the air and water buttons at the same time for spray (see Figure 29), then turn the air flow adjustment screw to achieve the desired spray.
   - Turn the adjustment screw clockwise (in) to decrease spray.
   - Turn the adjustment screw counterclockwise (out) to increase spray.

Disconnecting the Syringe Head

Disconnect the air supply. Use the syringe to bleed the system of air and water pressure.

Turn the syringe handle counterclockwise until the syringe separates from the handle then pull the syringe head away from the terminal.

When the syringe head is disconnected a little water, which is left inside of the syringe head and tubing, will drip out.

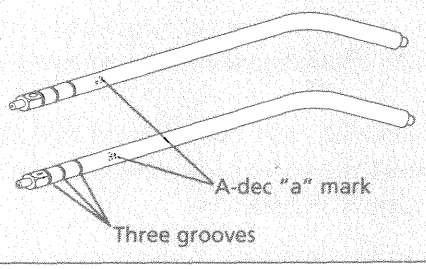
A-dec Syringe Tips

WARNING

USE ONLY A-DEC SYRINGE TIPS.

A-dec syringe tips have been engineered and manufactured for use with A-dec syringes. Using syringe tips manufactured by a company other that A-dec can result in syringe tip ejection while in use.

A-dec syringe tips have three grooves and a distinguishing A-dec "a" mark.



A-dec Syringe Tips

Changing the Syringe Tip

To remove the A-dec syringe tip, pull it straight out of the syringe tip retainer assembly (see Figure 30).

To ensure that the syringe will perform properly, it is important that you install the tip correctly.

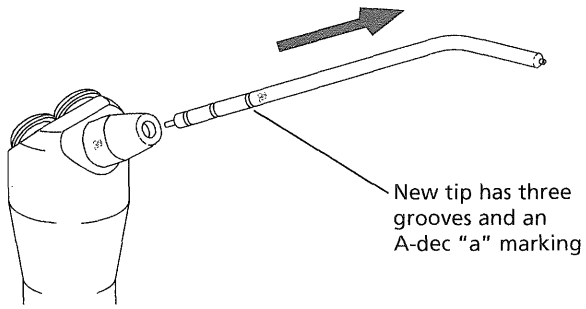


Figure 30. Changing an A-dec syringe tip.

Push the syringe tip into the syringe tip retainer assembly. As you push the tip in you will feel two "clicks" as O-rings inside the syringe tip retainer assembly slide into the grooves. If you do not feel two "clicks" when installing the syringe tip, do not use the syringe. The O-rings inside the syringe tip retainer assembly are damaged and may allow the syringe tip to be ejected. The syringe tip retainer assembly must be repaired before using the syringe.

When properly installed, none of the grooves on the A-dec syringe tip are visible (see Figure 31).

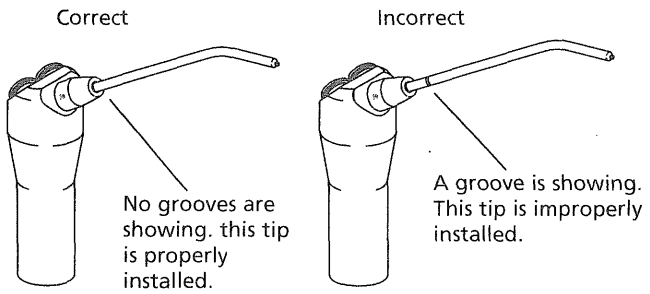

Correct
Incorrect
No grooves are showing. this tip is properly installed.
A groove is showing. This tip is improperly installed.

Figure 31. Installing the A-dec syringe tip.

After installing a tip, point the syringe at the floor and press the air button several times to be sure the tip is properly installed.

An improperly installed A-dec syringe tip allows water to enter the air tubing in the syringe tip.

Syringe and Tip Asepsis

All syringe tips are considered critical items and must be heat sterilized between patients. The syringe and syringe tips have been designed to be heat sterilized.

Pre-Cleaning

1. Remove the syringe tip from the syringe tip retainer and remove the syringe head from the syringe terminal (refer to *Disconnecting the Syringe Head* on page 9).
2. If the threads on the syringe head appear dirty, gently brush the threads free of debris using a nylon or brass bristle brush.
3. Remove the syringe tip for sterilization.
4. Immerse the tip in an appropriate holding solution until ready for ultrasonic cleaning.
5. Clean the syringe tips ultrasonically. Follow the instructions provided by the manufacturer of your ultrasonic cleaning equipment.
6. Purge all cleaning agents from the syringe and syringe tips.

WARNING

When ultrasonically cleaning syringe tips do not use cleaning solutions, which contain ammonia or amines.

These chemicals can be harmful to the brass syringe tips and can cause possible damage and tip ejection.

Sterilization

1. Rinse the syringe and syringe tips in clear water.
2. Use a dispensing bottle to flush isopropyl alcohol or Harvey's Vapo-Steril® through the tips.
3. Sterilize the syringe tips and/or syringe.

- Sterilize syringe tips using the methods of steam autoclave or chemical vapor (275°F [135°C] maximum temperature), or dry heat (340°F [170°C] maximum temperature).
- Sterilize the syringe using the methods of steam autoclave or chemical vapor (275°F [135°C] maximum temperature).

Handpiece Tubing Flush System

Your handpiece control system in equipped with A-dec's handpiece tubing flush system. The system flushes more water through the tubings in less time than is normally possible when operating the foot control only. The handpieces should not be connected when flushing the tubings.

How Often Should I Flush the Handpiece Tubings?

After Each Patient:

Flush the tubings for 20-30 seconds.

At the Beginning of Each Day:

Flush the tubings for 2-3 minutes.

Flushing the Handpiece Tubings

Locate the handpiece flush toggle on the underside of the control head (see Figure 32).

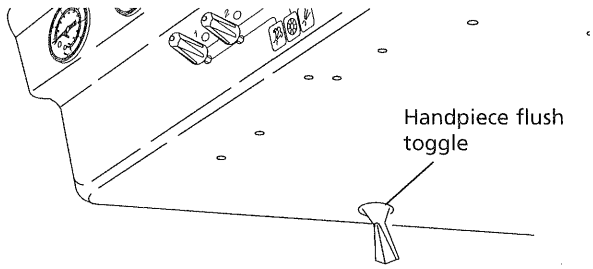


Figure 32. Pac I flush toggle

Gather up all the handpiece tubings that use water coolant and hold them over a water receptacle (see Figure 33). Be sure you hold the tubings so that the water will be directed away from you and into the receptacle.

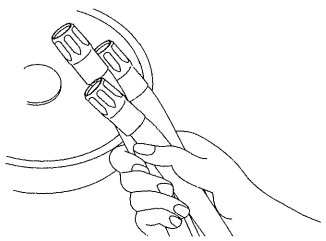


Figure 33. Flush the handpiece tubings.

Move the flush toggle to the On position and hold for the appropriate time required, either for flushing between patients or flushing at the beginning of the day. Water flows only as long as you hold the toggle in the On position.

Replace the handpiece tubings in their holders.

Self-Contained Water System

The A-dec self-contained water system is designed to optimize the quality of your dental unit water. It allows you to control the quality of water expelled from dental handpieces and syringes by:

- Selecting a quality source for dental unit treatment water
- Performing asepsis and treatment of your waterlines with proper disinfectant
- Maintaining clean dental unit waterlines to prevent accumulation of contaminates.

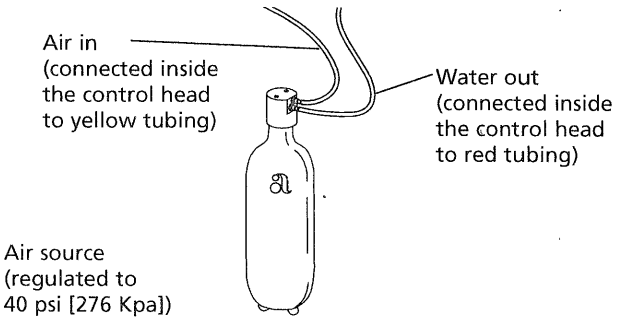

Air in
(connected inside the control head to yellow tubing)
Water out
(connected inside the control head to red tubing)
Air source
(regulated to 40 psi [276 Kpa])

Figure 34. Adjust the system air pressure.

How It Works

Air, regulated to 40 psi (276 kPa), is supplied to the water bottle through a restrictor barb attached to the bottle cap. The air pressure in the bottle forces the water from the bottle up into the water pickup tube and out to the handpiece control blocks and the syringes.

Benefits of using the A-dec self-contained water system are only fully realized when used in conjunction with an A-dec recommended waterline treatment protocol and followed by periodic monitoring. The three main components of the water system include the treatment water, the water bottle, and a water treatment protocol.

How to Choose Treatment Water

The correct water to use in your A-dec self-contained water system (for patient treatment) depends on the quality of water available from your municipal source and the goals you have for using the self-contained water system. It is important that whenever treatment water is specified for a procedure, that you are consistent in your water source quality.

Tap water

If you have confidence in the quality of water delivered by your municipal supply, you may consider using fresh tap water in your self-contained water system. Use of tap water must be done in conjunction with the operation and maintenance procedures prescribed in this manual. Failure to follow all procedures in this manual can result in dental unit water that contains higher than normal microbe counts.

Distilled water

If you have concerns about the quality of water delivered through your municipal supply, we recommend the use of water which has been distilled under the standards of the United States Pharmacopoeia (U.S.P.). Water distilled under these standards has been processed in optimum conditions. Most reputable bottled water companies operate under U.S.P. standards.

WARNING

Before handling, filling, and installing water bottles on the A-dec self-contained water system, take special care to wash hands with anti-microbial soap. Avoid touching the water pickup tube.

WARNING

Never use glass bottles on the A-dec self-contained water system. When pressurized, glass bottles can pose a serious safety hazard and are easily broken.

CAUTION

Failure to follow the suggested asepsis procedures in this manual can result in dental unit water that contains higher than normal microbe counts.

ICX Water Treatment Tablet

A-dec ICX offers a unique solution for waterline flushing and maintenance. It helps prevent contamination and maintains clean dental unit waterlines. By adding one tablet of ICX to each bottle refill, a low concentration of cleaner is continuously assured in the dental unit water. ICX was developed to be the most compatible and effective method for treating self-contained dental unit water systems. A-dec's recommendation for waterline maintenance is based on daily use of the A-dec ICX water treatment tablet.

ICX Water Treatment Protocol

A-dec ICX is an effervescing tablet that is added to an empty self-contained bottle before each filling.

The tablet is formulated to:

- Eliminate odors
- Help prevent build-up of deposits and help deter contamination in dental unit waterlines
- Provide a residual effect that helps maintain clean waterlines during periods of non-use.

The ICX tablet should be used in conjunction with regular testing of treatment water.

How to Use ICX

Before using A-dec ICX for the first time, test your water quality. If results indicate bacterial counts higher than your water quality goals, proceed to Waterline Preparation for ICX, otherwise begin daily use. Recommendations for dental unit water quality have been published by the American Dental Association (ADA) not to exceed 200 cfu/ml and the Center for Disease Control (CDC) not to exceed 500 cfu/ml. European Union Drinking Water Standards specify a maximum of 100 cfu/ml. Refer to your national regulatory authorities for recommendations specific to your local area. The steps below describe how to use ICX.

1. Before refilling bottle and at the start of every day, empty any remaining water left in the bottle.
2. Drop tablet into empty bottle. (To prevent contamination, avoid touching the tablet.)
3. Fill bottle with water, and connect to dental unit.
4. Wait 60 seconds for tablet to fully dissolve.
5. Connect the air supply tubing and turn the unit ON.

NOTE: If you are using this product for the first time on equipment that has already been in use, we recommend a special startup procedure to prepare the system for the usage of ICX (see Waterline Preparation for ICX).

Steril-Vac

Your A-dec Steril-Vac eliminates the need for a central vacuum. It is an air operated oral evacuation system using A-dec's AVS (Air Vacuum System) handpiece. Vacuum created at the handpiece forces the debris into the one quart (.95 liter) waste container. An (optional) two quart (1.9 liter) waste container is available.

Operating Your Steril-Vac

Air is supplied by attaching the quick disconnect (QD) tubing to the steril-vac QD (see Figure 35).

To actuate the vacuum, press and hold the button on the AVS handpiece (see Figure 35). The button is spring loaded to the Off position.

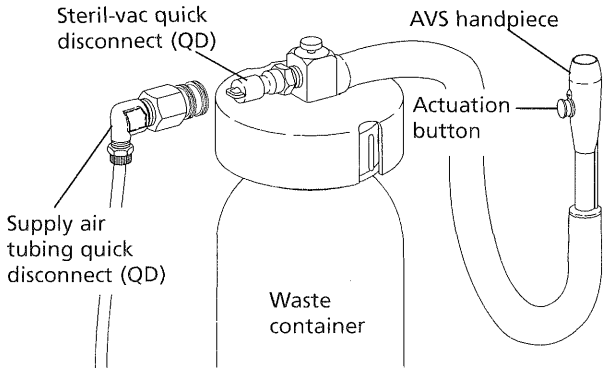


Figure 35. Steril-Vac

Cleaning Your Steril-Vac

After each patient, the Steril-Vac should be thoroughly rinsed by drawing clean water through the AVS handpiece. After rinsing, draw air through the system for a few seconds to clear all water from the tubing.

Remove the handpiece tip for cleaning and disinfecting. Consult your dental supply dealer for recommendations.

Daily cleaning of the AVS handpiece is necessary to prevent accumulation of debris. Several special cleaners with disinfectant properties for dental vacuum systems are available from dental supply dealers. If you use one of these cleaners, be sure to follow the manufacturer's recommendations. Never use a sudsing detergent to clean the AVS.

Use the brush provided in the field repair kit to clean the AVS handpiece. Push the brush all the way past the cross tube to clean the lower portion of the AVS handpiece. Rinse with clean water, then hold the button down until all the water has been purged from the tubing.

The Steril-Vac waste container should be cleaned and disinfected each time it is emptied.

Oil Collection System

The gauze pad (2x2) inside the oil collector jar on your unit needs to be changed once a week for normal usage. Change more often for heavy use.

- Remove the oil collector jar from the unit and discard the old gauze (see Figure 36).
- Fold in quarters a new two-inch square gauze pad and place against the spring inside the jar.
- Screw the oil collector jar onto the unit. Do not overtighten.

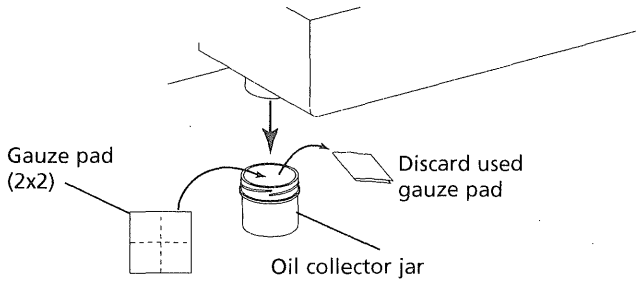


Figure 36. Oil Collection System

Care Instructions

For recommended asepsis instructions, refer to *Equipment Asepsis Owner's Guide (A-dec Publication No.85.0696.00).*

General Service Information

Parts Inspection

In the troubleshooting sections in this manual you will find references to the "seal area" as a location for possible defect, which will allow a valve to leak. The seal area is comprised of the seal itself (usually an O-ring), the bore or seat in the valve body, and the seal groove in the valve stem or piston.

Defects in any of these areas may result in leakage. A careful examination of all sealing parts and surfaces with a magnifier is essential for detecting flaws that are too small to see otherwise.

When servicing components that have rubber gaskets or diaphragms it is generally advisable to install new ones when reassembling the components. If the old gasket or diaphragm is to be re-used, carefully inspect the item for pin holes or cracks.

Cleaning Internal Parts

When servicing dental systems, the parts of any component disassembled should be thoroughly cleaned and inspected for defects before reassembly. The lubricant recommended for these parts is largely impervious to chemical solvents. The most effective cleaner is a hot detergent solution. Any wiping should be done with a soft, lint free cloth. Flush all parts with clear, hot water and rinse them in isopropyl alcohol.

Tool and Repair Kits

Included with your Pac I Unit is a Field Repair Kit (Part No. 45.0439.00). The Pac I Field Unit is equipped with a tool kit. If you have the Pac I Institutional and Self-Contained Unit and would like to order the tool kit, ask your dealer or call A-dec for the Pac I Institutional or Self-Contained Unit Tool Kit (Part No. 45.0438.00). Refer to page 34 for a complete listing of the items in these kits.

The following items are not necessary but may be useful for Pac I maintenance and service.

O-ring Tools

These tools allow quick field repair of most A-dec miniature components. The three tools in this set fit the four smallest O-ring sizes in A-dec equipment. Instructions for the use of the O-ring tools are included with the set.

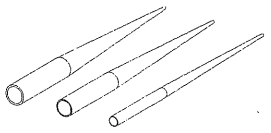


Figure 37. O-ring Tools (A-dec Part No. 009.013.00)

Hemostats

Hemostats are useful for temporarily stopping air or water flow through the tubing while troubleshooting or repairing the unit.

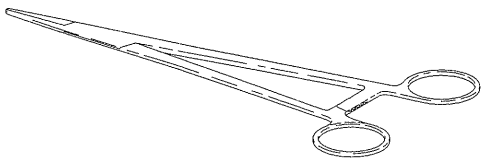


Figure 38. Hemostats (A-dec Part No. 009-008-00)

Valve Test Syringe

The valve test syringe is used to make quick tests of pilot-operated valves. The valve test syringe can be used to apply a static pressure of 5 (34.5 kPa) to 75 psi (518 kPa).

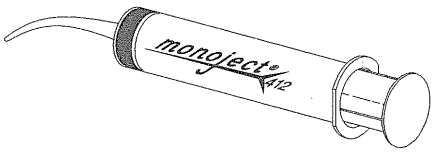


Figure 39. Valve Test Syringe (A-dec Part No. 98.0050.00)

10x Magnifier

The 10x magnifier is used to inspect miniature valve parts for defects.

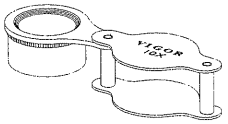


Figure 40. 10X Magnifier (A-dec Part No. 009.009.00)

Test Gauge

The test gauge is used to check air pressure at various points while troubleshooting the system. Also required for use of this gauge:

- One 1/8" (3.2mm) barb, A-dec Part No. 023.028.00.
- One washer, A-dec Part No. 004.005.00.
- One plastic tee, A-dec Part No. 023.014.00.
- Two uni-clamps for 1/8" (3.2mm) tubing, A-dec Part No. 025.007.00.
- 1/8" (3.2mm) Clear tubing, 2' (610mm) long, A-dec Part No. 024.015.00.

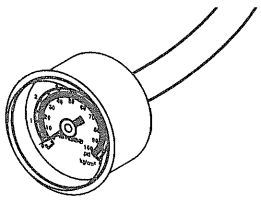


Figure 41. Test Gauge (A-dec Part No. 026.014.00)

Snap Ring Pliers

The snap ring pliers are used to install and remove both internal and external snap rings. It fits all the snap ring sizes used in A-dec equipment.

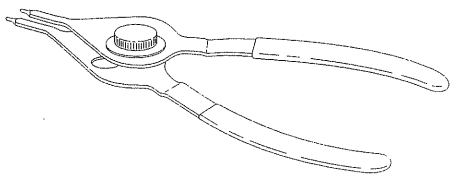


Figure 42. Snap Ring Pliers (A-dec Part No. 009.007.00)

Tubing Pliers

These modified pliers are used to push 1/8" (3.2mm) tubing onto the barbed fittings.

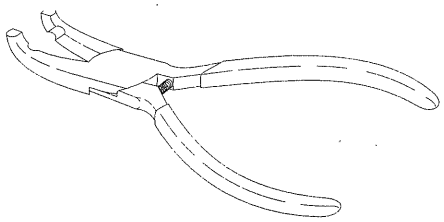


Figure 43. Tubing Pliers (A-dec Part No. 009.014.00)

A-dec Sleeve Tool (included in the tool kit)

The A-dec Sleeve Tool is used to press the 1/4" (6.4mm) and 1/8" (3.2mm) tubing sleeves in place when installing the tubing on barb fittings.

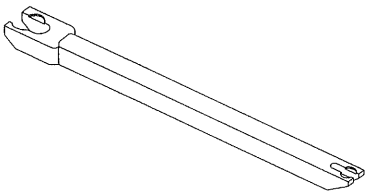


Figure 44. Sleeve Tool (A-dec Part No. 98.0072.00)

Hex Wrench Set (included in the tool kit)

A complete hex wrench set which includes all hex wrenches that might be required in servicing A-dec equipment. The plastic holder keeps the hex wrenches together and easily identifiable.

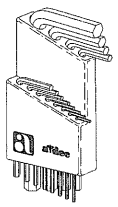


Figure 45. Hex Wrench Set (A-dec Part No. 009.018.00)

Lubrication (included In the field repair kit)

A-dec silicone lubricant is a high quality silicone base grease. It is ideal for lubricating internal moving parts such as O-rings and oral evacuator valves.

Before installing O-rings always apply a light coat of silicone lubricant. This makes the installation of the O-ring easier and will prevent the O-ring from being damaged. An acceptable substitute for A-dec lubricant is Dow-Corning® No. 103 Silicone Lubricant.

Figure 46. Silicone Lubricant (package of 6) (A-dec Part No. 98.0090.01)

How Your Pac I Works

Your Pac I is engineered to provide many years of reliable service, even under the "less than ideal" conditions a portable dental delivery system may encounter. An important part of that engineering is the uncomplicated, straightforward design.

Refer to the schematic on the opposite page as you read this section.

The supply air (the only external connection required) attaches to the quick disconnect (QD) at the bottom rear of the unit. The air goes directly to the air filter/regulator where it is filtered and regulated to 80 psi (552 kPa).

The air is then distributed from the air filter/regulator manifold to seven places: 2 QDs which supply the Steril-Vac and the (optional) air saliva ejector (ASE), the foot control, the water (air pressure) regulator, the system air pressure gauge, the syringe, and the handpiece selector valve, which relieves the holdback air to the control block of the handpiece selected (thereby making the selective handpiece active).

The foot control distributes the air to three places: the coolant air flow control valve, the Century II control system, and the (optional) chip blower button.

The Century II control system routes coolant air, coolant water, and drive air to the selected handpiece when the foot control disc is depressed.

Water is supplied by the self-contained water system. Air pressure, regulated to 40 psi (276 kPa), forces the water from the bottle to the Century II control system, the flush valve, and the syringe.

Waste water and debris are removed by the Steril-Vac and the (optional) ASE.

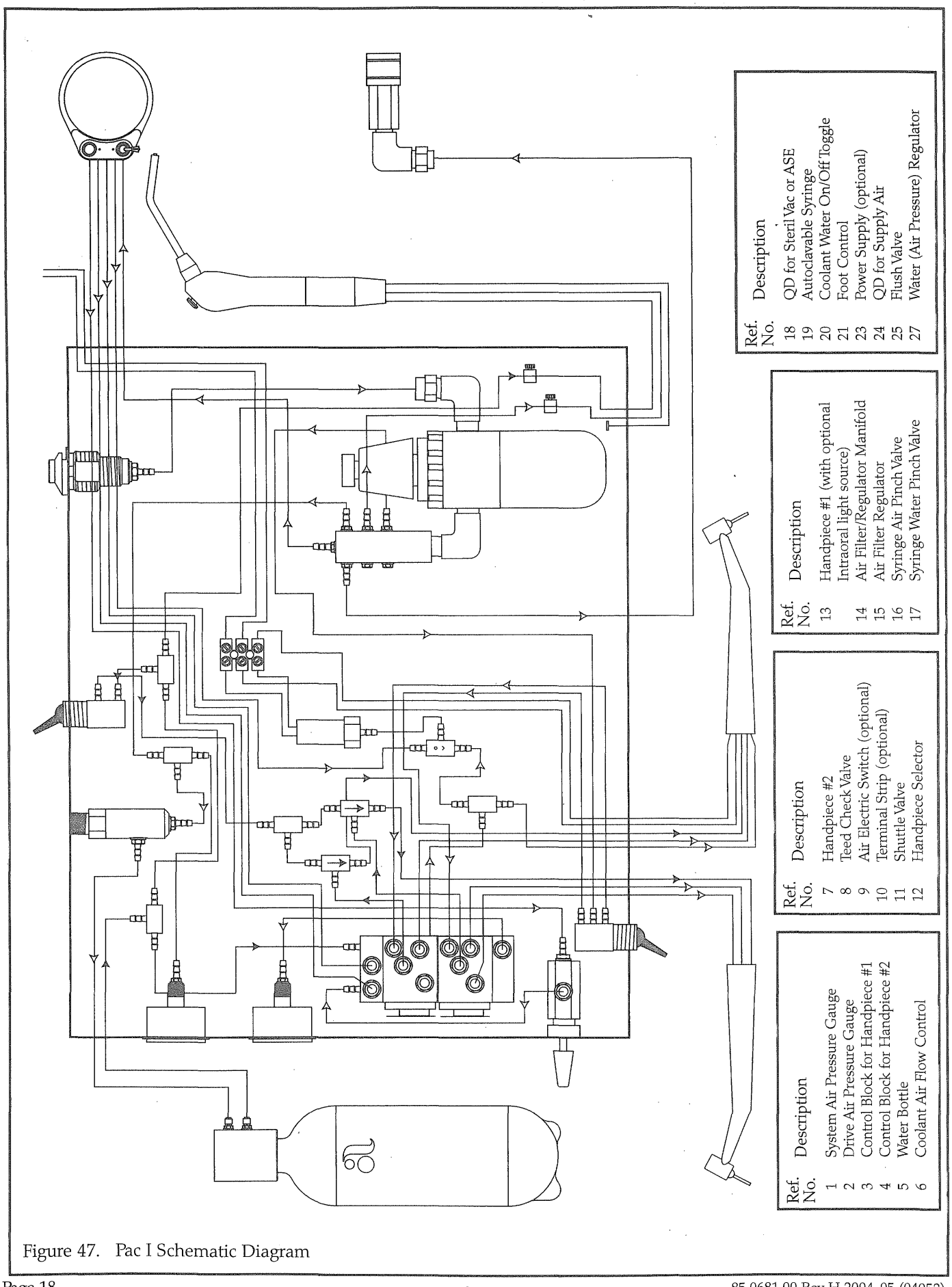

Ref. No. Description
1 System Air Pressure Gauge
2 Drive Air Pressure Gauge
3 Control Block for Handpiece #1
4 Control Block for Handpiece #2
5 Water Bottle
6 Coolant Air Flow Control
Ref. No. Description
7 Handpiece #2
8 Teed Check Valve
9 Air Electric Switch (optional)
10 Terminal Strip (optional)
11 Shuttle Valve
12 Handpiece Selector
Ref. No. Description
13 Handpiece #1 (with optional Intraoral light source)
14 Air Filter/Regulator Manifold
15 Air Filter Regulator
16 Syringe Air Pinch Valve
17 Syringe Water Pinch Valve
Ref. No. Description
18 QD for Steril Vac or ASE
19 Autoclavable Syringe
20 Coolant Water On/Off Toggle
21 Foot Control
23 Power Supply (optional)
24 QD for Supply Air
25 Flush Valve
27 Water (Air Pressure) Regulator

Figure 47. Pac I Schematic Diagram

Basic Troubleshooting

Given proper care, your Pac I will provide years of reliable service. In the event that something does go wrong with the unit, this troubleshooting section tells what can be done in the operatory before removing the unit for repair.

This detail is not intended to isolated every problem that could arise. It is designed so you can quickly identify the problems that can be repaired without special training or equipment.

If the procedures given here do not identify and correct the problem, much more detailed instructions are given in the sections covering the individual components of your Pac I.

Neither Handpiece Works (No Air or Water)

1. Does the syringe work?

   Yes: Check for pinched or crimped foot control tubing. If the tubing is okay, refer to *Foot Control III Valve Troubleshooting* section on page 25.

   No: Proceed to Step 2.
2. Is the supply air (compressor or bottled gas system) turned on and functioning?

   Yes: Proceed to Step 3.

   No: Connect the supply air tubing and re-test the unit. If this did not correct the problem, consult the documentation that came with your compressor or bottled gas system.
3. Is the supply air tubing properly connected?

   Yes: Refer to the Air Filter/Regulator Assembly section.

   No: Connect the supply air tubing and re-test the unit.

No Coolant Water From Either Handpiece

1. Does the syringe work?

   Yes: Proceed with Step 2.

   No: Verify that there is water in the self-contained water bottle.
2. Is the wet/dry toggle on the foot control in the On position (toward the blue dot)?

   Yes: Proceed to Step 3.

   No: Move the toggle to the On position (toward the blue dot) and re-test the unit.
3. Are the coolant water flow controls open?

   Yes: Proceed to Step 4.

   No: Set the coolant water controls as specified in `Routine Adjustments`. Then, re-test the unit.
4. Does the handpiece coolant air work?

   Yes: Refer to the `Century II Control Blocks` section.

   No: Refer to the `Signal Relay Valve` section.

Insufficient Drive Air Pressure

1. Does the problem affect both handpieces?

   Yes: Proceed to Step 2.

   No: Refer to the drive air pressure adjustment procedures in `Routine Adjustments`.
2. Check the system air pressure gauge. Does it show a pressure of at least 70 psi (483 kPa)?

   Yes: Proceed to Step 3.

   No: Refer to the `Air Filter/Regulator Assembly` section.
3. Watch the system air pressure gauge while pressing the syringe right-hand (air) button. Does the pressure drop by more than 15 psi (103 kPa)?

   Yes: Remove and inspect the air filter according to the Clogged Filter Element instructions in *Air Filter/Regulator* section on page 20.

   No: Refer to the `Foot Control II Valve` section.

Air Filter/Regulator

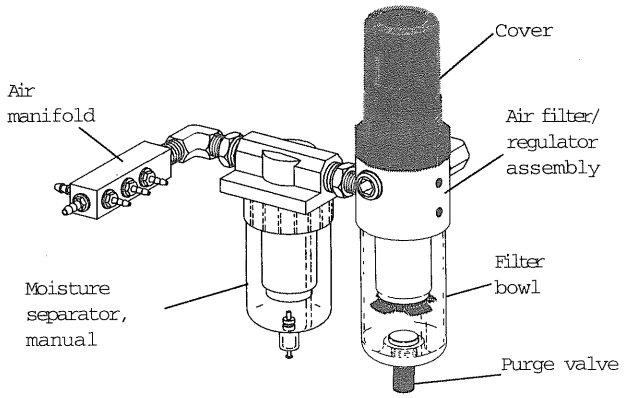


Figure 48. Air filter/regulator assembly

The supply air passes through the filter before entering the regulator. The filter element should be serviced when it becomes sufficiently clogged to impede the flow to the regulator.

Servicing the Air Filter/Regulator

The air filter/regulator assembly (24.0030.00) used in the Pac I is subject to only three types of problems: (1) clogged filter element, (2) external leakage, and (3) internal leakage.

To service any part of the air filter/regulator, first locate the Air Filter/Regulator Service Kit (A-dec Part No. 90.1066.00), which is in your field repair kit. Included in the service kit are an exploded drawing of the assembly and replacement parts.

Checking the Filter

First, ensure the supply air is connected. Watch the system air pressure gauge while pressing the right-hand (air) button of the syringe. If the pressure drops by more than 15 psi (103 Kpa), the filter element is clogged and must be replaced.

Clogged Filter Element

To replace the filter element:

1. Disconnect the supply air tubing from the control head.
2. Relieve system pressure by pressing the syringe air (right-hand) button, and by loosening the water bottle.
3. From the bottom of the unit, unscrew the bowl, remove the filter element and the filter element retainer.
4. Install the new filter element (97.0401.00) included in the service kit, then reinstall the filter, retainer, and bowl.

External Leakage

In the event of external leakage, take the following action according to the point of leakage:

1. The leakage is coming from the purge valve at the bottom of the filter bowl.

   The leak may result from a loose or defective purge valve.

   - Tighten the purge valve.
   - If the leak persists, replace the bowl assembly which includes the purge valve (A-dec Part Number 97.0403.00).

2. The leakage is coming from around the top of the filter bowl.

   The leak may result from a loose filter bowl, or from a defective O-ring seal.

   - Tighten the filter bowl.

3. The leakage is coming from around the top of the regulator.

   The leak may result from a loose cover or a defective diaphragm.

   - Tighten the regulator cover.
   - If the leak persists, replace the diaphragm (A-dec Part Number 97.0402.00)

Internal Leakage

If the system air pressure gauge shows that pressure creeps up when the unit is not being used, there is air leaking past the inlet seal. This can normally be corrected by replacing the poppet (97.0402.00) and spring (97.0404.00) included in the Air-Filter Regulator Service Kit (A-dec Part No. 90.1066.00). When installing the new poppet, be certain there is no foreign material on the sealing surfaces in the valve body.

Century II Control Blocks

The Century II Control Blocks control the routing of drive air, coolant air and coolant water to the handpieces. The control blocks are used in conjunction with the Century II manifolds, a manual selector valve, and a coolant flow control valve to make a complete control system.

Operating Principles

Each of the Century II control blocks has laterally drilled passages for drive air, coolant air, coolant water, and signal air (see Figures 49 and 50). These passages line up with the outlet passages in the end of the Century II manifold.

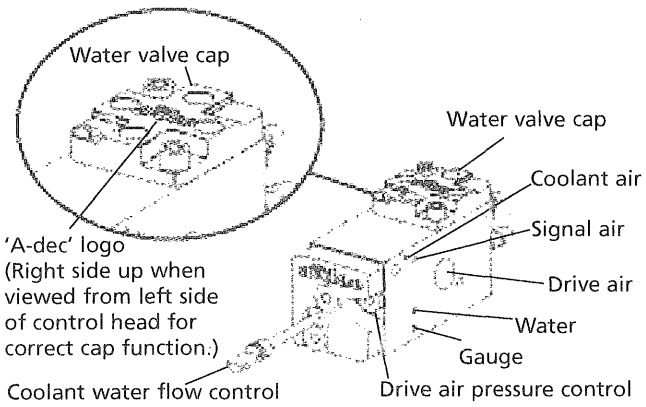


Figure 49. Control block (front and side view)

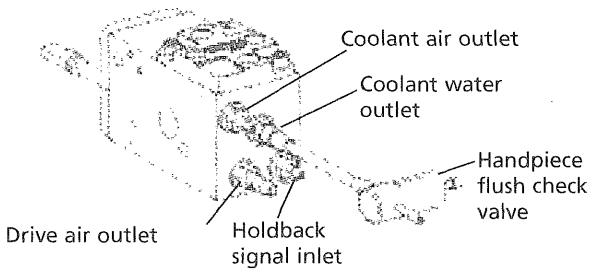


Figure 50. Control block (rear and side view)

In each control block, the lateral passages for the drive air, coolant air, and signal air intersect with the longitudinal passages that lead to the front surface of the block. Parallel to these, other longitudinal passages lead to the handpiece drive air barb, the handpiece pressure gauge, the handpiece coolant air barb, and the cap for the water valve (see Figure 51).

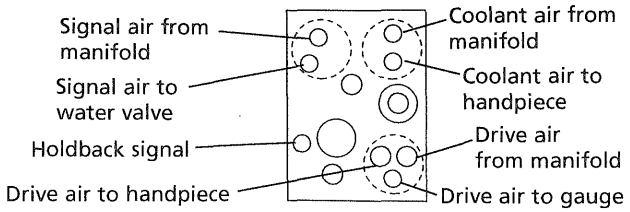


Figure 51. Control block (front surface, detail)

It is here, at the front surface of the control block, that the air from the foot control is either held back or allowed to flow through and run the handpiece.

The front cover of the control block (see Figure 52) has three cavities in the inner surface. As indicated by the broken lines in Figure 51, the cavities in the cover correspond in location to the three groups of passages drilled in the front of the control block. When the block is assembled, with the diaphragm in place between the control block and the front cover, the cavities allow the diaphragm to deflect away from the surface of the block, so air can flow between the grouped passages.

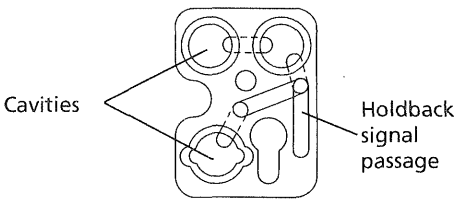


Figure 52. Control block front cover (inner surface, detail)

However, the flow between the grouped passages can occur only if the diaphragm is allowed to deflect into the cavities in the cover. Air pressure from the handpiece selector valve applied into the cavities presses and holds the diaphragm against the control block. This prevents any flow between the passages, so the handpiece cannot operate.

The handpiece selector valve supplies the holdback signal that pressurizes the cavities in the cover and shuts off the control block for the handpiece not being used. The selector valve releases the holdback signal to the control block for the handpiece selected, allowing air to pass through the block to the handpiece.

Coolant water for the handpiece is controlled by an integral water valve in the Century II control block (see Figure 53).

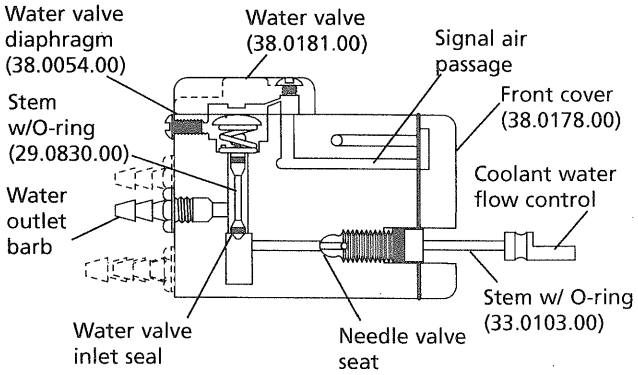


Figure 53. Control block (water valve cross-section)

The water is supplied through a passage from the manifold. This passage intersects with the coolant water flow control needle valve bore (see Figure 53). After passing the needle valve seat, the water flows to the inlet seal at the bottom of the water valve stem. Unless the water valve is actuated, the flow of water is blocked at this point.

Actuation of the water valve occurs when air pressure is applied above the water valve diaphragm, in the water valve cap (see Figure 53). The signal air reaches the water valve cap after passing the hold-back diaphragm at the front of the control block. When the signal air reaches the water valve cap, it deflects the diaphragm downward. This, in turn, pushes the stem downward and unseats the inlet seal, allowing water to flow through the valve to the outlet barb.

Releasing the signal air pressure allows the spring to push the stem and diaphragm back up, to close the water valve.

The next section, Century II Control Block Troubleshooting, takes you from symptom to corrective action. When servicing the control blocks, first locate the Century II, Pac I Service Kit (A-dec Part No. 90.0043.00) which is in your field repair kit. Included in the service kit are an exploded drawing of the control block and replacement parts.

Century II Control Block Troubleshooting

Symptom	Possible Cause	Test Procedure	Corrective Action	
			If Test Is Normal	If Test is Abnormal
Audible air leakage from the control block area	Loose connections	Locate the exact point of leakage, use a soap solution if necessary. Tighten the tie bolt that secures the control blocks together and the screws that secure the water valve cap and front cover to the control blocks.	If no leakage is found on the control blocks, check the barb connections.	If tightening the fasteners fails to stop the leakage, proceed with the next step.
	Defective gasket, O-ring , or diaphragm seal	For leakage between the control blocks, replace the gaskets. For leakage between the block and the front cover, replace the holdback diaphragm. For leakage around the water valve cap, replace the water valve diaphragm.	If this stops the leakage, no further action is required.	If leakage continues, check for flaws in the sealing surfaces. Replace any defective parts.
Water leakage from the control block	Loose connections	Depending on the point of leakage, tighten the socket-head screws that secure the cap to the top of the block, or the tie bolts that hold the control block together.	If this stops the leakage, no further action is required.	If tightening the fasteners fails to stop the leakage, proceed with the next step.
	Defective gasket or diaphragm seat	For leakage between the blocks, replace the gasket. For leakage around the water valve cap, replace the water valve diaphragm.	If this stops the leakage, no further actions is required.	If leakage continues, check for flaws in the sealing surfaces. Replace the defective parts.
Air bubbles in the coolant water	Low water level in the water bottle	Check the water bottle to ensure it has an adequate supply of water.	If it does, proceed to next step.	Refill the water bottle.
	Loose fasteners	Tighten the socket-head screws that secure the water valve cap to the control block, and tighten the tie bolt that secures the blocks together.	If this corrects the problem, no further action is required.	If there is still air in the water, proceed to the next step.
	Cross-leakage under the water valve diaphragm	Remove the cap from the top of the control block and carefully inspect the diaphragm and the surfaces of the block and cap.	If no defects are observed, install a new diaphragm. Re-assemble and test the unit.	Replace any defective parts. Re-assemble and test the unit.
Water drips continuously from the handpiece while the unit is not in use	Improperly installed water valve cap	Look at the top of the control block. The A-dec name should be right side up when viewed from the left-hand side of the unit.	If the cap is properly installed, proceed to the next step.	If it is wrong, remove the cap and install it correctly. Retest the unit.
	Water valve stem is stuck or has a defective return spring	Disconnect the supply air, and relieve system pressure by loosening the water bottle. Remove the cap and diaphragm from the control block. Press and release the water valve stem to check its freedom of movement.	If the stem seems to move freely, proceed to the next step.	If it sticks, remove the stem and inspect it for debris and defects. Replace any defective parts. Reassemble and test the valve.
	Defective inlet seal in the water valve	Remove the stem, and inspect the inlet seal O-ring.	If the O-ring is not defective, proceed to the next step.	Replace any defective parts. Reassemble and test the valve.
	Defective seat in the control block	There is no test to verify this, except the elimination of other possibilities as explained in the preceding steps.		Replace the control block. Reassemble and test the unit.

Century II Control Block Troubleshooting

Symptom	Possible Cause	Test Procedure	Corrective Action	
			If Test Is Normal	If Test is Abnormal
Air or water leaks from a handpiece that is not in use, only when another handpiece is being used	The holdback diaphragm is defective or improperly installed	Disconnect the air supply, then remove the front cover from the control block for the leaking handpiece. Check for defects in the diaphragm.	If the diaphragm is not defective, proceed to the next step.	If the diaphragm is defective, install a new one. Reassemble and test the unit.
	Defect in the front surface of the block	Visually inspect the front surface of the block in the area of the air passages.	If no defects are visible, carefully reassemble the control block and test the unit.	If the surface is defective, install a new control block. Reassemble and test the unit.
Coolant sometimes sprays momentarily from the handpieces as the selector valve is turned	The foot control valve fails to exhaust when it is released	Refer to the instructions in *Foot Control III Valve* for the test procedures.		Take corrective action as indicated in the foot control valve instructions on page 26.
Restricted flow of air or water	Debris blocking internal passages	Check first for pinched tubing or other restrictions outside the Century II control block system.	If the signal relay is okay, look for a pinched or plugged tube between the signal relay and the handpiece control system.	Clean all debris from the barbs and passages. Make sure no tubes are crimped or pinched.
No coolant air or coolant water from either handpiece	Defective signal relay on the foot control	Refer to the signal relay instructions and conduct the tests for "No signal from the signal relay valve."	If the signal relay is okay, look for a pinched or plugged tube between the signal relay and the handpiece control system.	
No coolant air from either handpiece (coolant water works properly)	The coolant air flow control is closed	Turn the coolant air flow control counterclockwise while running a handpiece.	If the coolant air starts flowing, adjust for the desired spray.	If this does not start the coolant air flowing, proceed to the next step.
	Obstructed air passage in the control block	Select one of the handpieces, then step on foot control disc. If air comes from the handpiece, the control blocks are okay. If no air comes out, there is an obstruction in the control block.	If the test indicates the control blocks are okay, look for pinched tubing.	If the test indicates an obstruction in the control block, disconnect the supply air and remove the tie bolt. Use a wire to probe the passages and dislodge any debris. Reassemble and test the unit.

Century II Control Block Troubleshooting

Symptom	Possible Cause	Test Procedure	Corrective Action	
			If Test Is Normal	If Test is Abnormal
No coolant air from one handpiece	Clogged tube in the handpiece	Switch the handpieces around and test each one, to determine whether the problem is in the handpiece or the control block.	If the problem is in the handpiece, clean or replace the coolant air tube.	If the problem is in the control block, proceed to the next step.
	Clogged passage in the control block	Disconnect the supply air, then remove the front cover and diaphragm from the control block. Remove the coolant air outlet barb.	If no obstructions are found, check the handpiece tube and connector.	If there is debris in the control block passages, clean it out. Check the filter, then reassemble and test the unit.
No coolant water from one handpiece	Closed coolant water flow control	Turn the coolant water flow control counterclockwise, while running the hand-piece.	If coolant water begins to flow, adjust the valve for the desired flow rate.	If there is no flow when the knob is turned fully counterclockwise, proceed to the next step.
	Improperly installed water valve cap	Look at the top of the control block. The A-dec name should be right side up when viewed from the left-hand side of the unit.	If the cap is properly installed, proceed to the next step.	If the cap is not properly installed, remove it and install it correctly. Retest the unit.
	Leaking water valve diaphragm	Remove the water valve cap and inspect the diaphragm for leaks.	If the diaphragm is not defective, check for clogged passages or barbs in the control block.	If the diaphragm is defective, install a new one. Reassemble and test the unit.

Foot Control III Valve

The A-dec Foot Control III Valve is actuated by foot pressure on the disc, which depresses the piston assembly in the valve bore. This displaces the poppet allowing air to flow to the outlet. When foot pressure is released, the piston returns, sealing the inlet at the poppet. Any pressure from the outlet side of the valve is then exhausted up through the middle of the piston.

The signal relay valve is covered in a section, found on page 27.

When servicing the foot control, first locate the Foot Control III Service Kit (90.0593.00), which is in your field repair kit.

WARNING

Before removing the foot control cover, disconnect the supply air and bleed all pressure from the system.

If the supply air must be active while testing the foot control, ensure that the valve stem cannot be ejected before connecting the supply air.

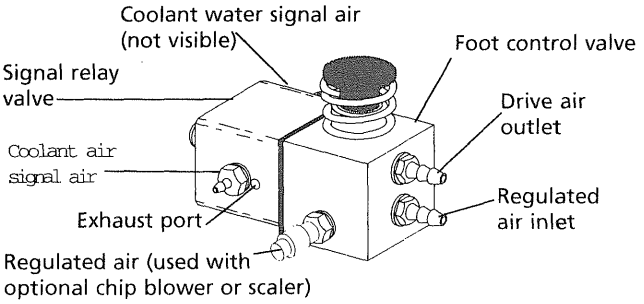


Figure 54. Foot control valve

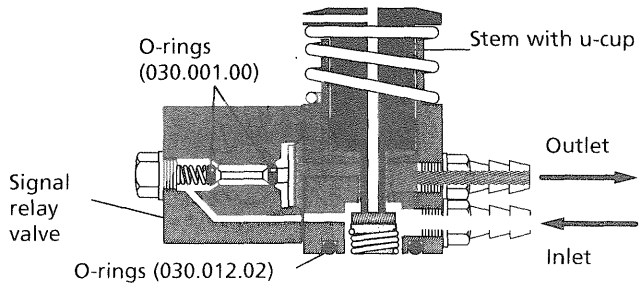


Figure 55. Control block front cover

Foot Control III Valve Troubleshooting

Symptom	Possible Cause	Test Procedure	Corrective Action	
			If Test Is Normal	If Test is Abnormal
Audible leakage while the foot control is not being used	Loose mounting screw	Turn the foot control face down and tighten the two socket-head screws at the center of the foot control baseplate.	If the leakage stops, no further action is required.	If the leakage does not stop, proceed to the next step.
	Loose connection	Note the "Warning." Remove the foot control disc and use a soap solution if necessary, to locate the source of the leakage. For leakage coming from the signal relay valve, refer to the instructions covering the signal relay on page 27.	If the air is leaking around the barb connection, tighten the barb and re-test the valve.	If the air is leaking from the exhaust vent or around the bottom of the valve body, proceed to the next step.
	Defective O-rings or sealing surface	Disconnect the supply air, bleed the air pressure, then disassemble the foot control. Inspect the O-rings on the signal relay stem and sealing surfaces for defects and debris.	If no defects are noted, carefully clean and lubricate the parts. Reassemble and test the valve.	Replace any defective parts. Carefully clean and lubricate all parts. Reassemble and test the valve.
Inadequate air flow from the foot control	Inadequate air flow to the foot control	Refer to the instructions for the air/filter regulator.	If these tests indicate there is adequate air in the system, proceed to the next step.	If any of the tests indicate a problem in the air supply to the foot control, take the corrective action recommended.
	Pinched tubing going to or from the foot control	Inspect the foot control tubing for crimps or restrictions.	If no problem is found, proceed to the next step.	If the tubing is crimped, install a new one and test the unit.
	Obstruction at the inlet or outlet	Note the "Warning.". With the cover removed, depress the piston and check for adequate air flow.	If no defects are noted, carefully clean and lubricate the parts. Reassemble and test the valve.	Replace any defective parts. Carefully clean and lubricate all parts. Reassemble and test the valve.

Foot Control III Valve Troubleshooting				
Symptom	Possible Cause	Test Procedure	Corrective Action	
			If Test Is Normal	If Test is Abnormal
Foot control is sluggish	The stem is sticking	Note the "Warning" on the previous page. Remove the valve body from the foot control baseplate. Remove and inspect the O-rings and piston for debris or defective parts.	If it works easily and smoothly, check for a weak or improperly installed spring.	If there is any sticking or binding, remove the stem, and O-rings. Replace any defective parts. Carefully clean and lubricate all parts. Reassemble and test the valve.

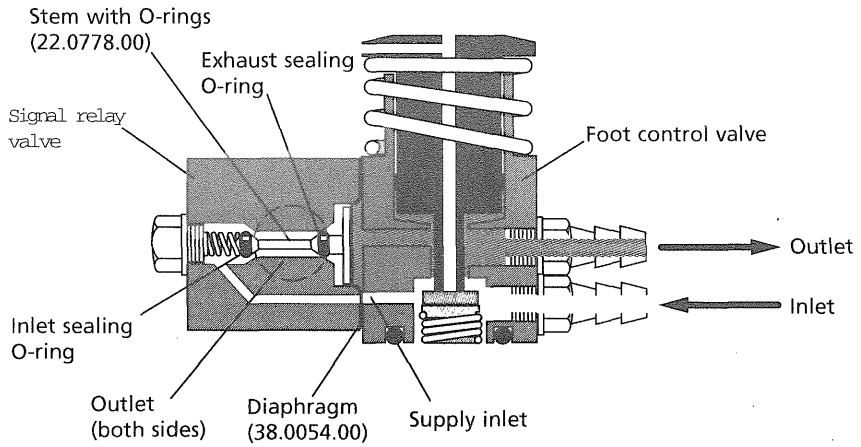


Figure 56. Foot control signal relay valve

Signal Relay Valve

The signal relay valve is a pilot operated three-way valve that mounts on the foot control valve body to provide handpiece coolant air and the handpiece water coolant signal. The valve is actuated by air pressure from the foot control valve outlet. This deflects the diaphragm and moves the stem to close the exhaust seal and open the inlet seal. A flow of air, at regulated supply pressure (80 psi [552kPa]), passes through the signal relay valve to the outlet. When the foot control is released, the diaphragm and stem return to their original positions, closing the inlet seal and exhausting any pressure at the outlet.

(Continued on page 28.)

WARNING

Before removing the foot control cover, disconnect the supply air and bleed all pressure from the system.

If the supply air must be active while testing the foot control, ensure that the valve stem cannot be ejected before connecting the supply air.

Signal Relay Valve Troubleshooting

Symptom	Possible Cause	Test Procedure	Corrective Action	
			If Test Is Normal	If Test is Abnormal
No signal from the signal relay valve	The signal relay valve is installed upside down	Visually check the signal relay valve. It must be positioned as shown in figure 54, so the inlet passage lines up with the passage on the foot control valve body.	If the signal relay is properly installed, proceed to the next step.	If the signal relay is installed wrong. Remove it and install it properly. Retest the unit.
	Defective or improperly installed diaphragm	Remove the signal relay from the foot control and check for defects, debris, or improper installation. The holes in the diaphragm must be aligned with the passages in the valve body.	If do defects are noted, clean all parts. Reassemble and test the valve.	Replace any defective parts. Reassemble the valve, making sure all parts are properly installed.
Air signal from the signal relay does not shut off	The stem return spring is missing	Remove the hex plug from the end of the signal relay valve and verify that the spring is in place.	If the spring is there, proceed to the next step.	If the spring is missing or defective, replace it and retest the valve.
	The valve stem is stuck in the open position	Disassemble the signal relay valve and inspect all parts for defects, debris, or improper installation.	If no defects are found, carefully clean all parts. Lubricate the stem and O-rings, then reassemble and test the valve.	Replace any defective parts. Lubricate the stem and O-rings, then reassemble and test the valve.
Audible air leak while the unit is not in use	Improper seating of the diaphragm	Note the "Warning" on page 27. Use a soap solution, if necessary, to locate the source of the leakage.	If the leakage is from the exhaust holes on the sides of the signal relay, proceed with the next step.	If the leakage is at the diaphragm line, tighten the signal relay mounting screws If leaking persists, replace the diaphragm.
	Signal relay inlet seal does not fully close	If the leakage is from the exhaust holes, disconnect the supply air, then remove the signal relay from the foot control. Inspect the stem, O-rings, and seats for debris or defects.	If no defects are noted, carefully clean and lubricate the parts. Reassemble and test the valve.	Replace any defective parts. Clean and lubricate the parts, then reassemble and test the valve.
Audible air leakage while the unit is in use	Improper seating of the diaphragm	Depress the foot control until the relay is actuated. While listening to the leak, depress the foot control all the way.	If there is no change in the sound of the leak, proceed to next step.	If the leaking increases with pressure on the foot control, tighten the signal relay mounting screws. If leakage persists, replace the diaphragm.
	Signal relay exhaust seal does not fully close	Note the "Warning" on page 27. While the foot control is depressed, check for leakage from the exhaust holes in the signal relay body.	If there is no leakage from the holes, check the outlet barb and tubing. Tighten the barb or the sleeve as necessary to stop the leak.	If air comes from the exhaust holes, inspect the exhaust seal area for debris or defects. Replace any defective parts. Clean and lubricate all parts, then reassemble and test the valve.

Servicing the Flush Valve

A defective flush valve can cause two problems:

- water leakage from around the flush valve toggle
- water dripping from the handpieces.

To service the flush valve, first locate the Century II, PAC 1 service kit (90.0043.00), which is in you field repair kit. Included in the service kit are an exploded drawing of the assembly and replacement parts.

How to Service the Flush Valve:

1. Disconnect the supply air, then loosen the water bottle.
2. Remove the hex nut and pull the valve assembly into the control head. It is not necessary to disconnect the tubing.
3. Remove the pin, then remove the stem (see Figure 57).

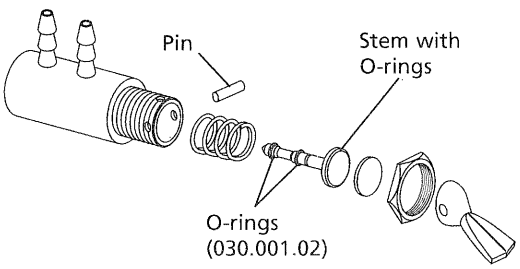


Figure 57. Flush Valve Assembly (A-dec part no. 33.0009.01)

4. Check the O-rings and stem for defects and replace if necessary.
   - O-rings (030.001.02)
   - Stem w/O-rings (29.0830.00)
5. Reassemble the valve and check for leakage.
6. If this does not correct the problem of water dripping from the handpieces, refer to Century II Control Block Troubleshooting section on page 23.

Servicing the Handpiece Selector Valve

If you step on the foot control and both handpieces run, the problem could be a defective handpiece selector valve.

To service this valve, first locate the Century II, PAC 1 service kit (90.0043.00), which is in your field repair kit. Included in the service kit are an exploded drawing of the assembly and replacement parts.

1. Disconnect the supply air, then bleed system pressure by operating the syringe.
2. Remove the hex nut and pull the valve assembly into the control head. It is not necessary to disconnect the tubing.
3. Remove the pin, then remove the stem (see Figure 58).
4. Check the O-rings (030.001.02) for defects and replace if necessary.
5. Reassemble the valve and test the unit.
6. If both handpieces still run, check the holdback air diaphragm (refer to the Century II Control Blocks section on page 22) and replace if necessary.
7. If this does not correct the problem, replace the handpiece selector valve assembly (33.0104.01).

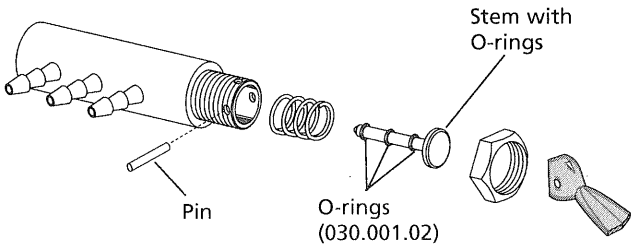


Figure 58. Selector valve assembly (A-dec part no. 33.0104.01)

Autoclavable Syringe

Service Replacement Parts

The Autoclavable Syringe Service Kit, located in the field repair kit, contains all the syringe parts subject to wear during normal use. Service kit parts, designated by an asterisk*, are shown in Figure 59.

USE ONLY A-DEC SILICONE LUBRICANT WHEN PERFORMING MAINTENANCE ON AN A-DEC SYRINGE.

The O-rings used in the syringe head and syringe tip retainer assembly are a compound (Ethylene Propylene) that must not be lubricated with petroleum based lubricants. The use of petroleum based lubricants (jellies, creams, or lotions) will cause the O-rings in the syringe to swell and/or deteriorate, resulting in syringe malfunction or failure.

USE ONLY A-DEC REPLACEMENT PARTS WHEN PERFORMING MAINTENANCE ON AN A-DEC SYRINGE.

A-dec replacement parts have been precisely designed for the A-dec syringe and ensure that the syringe will function properly.

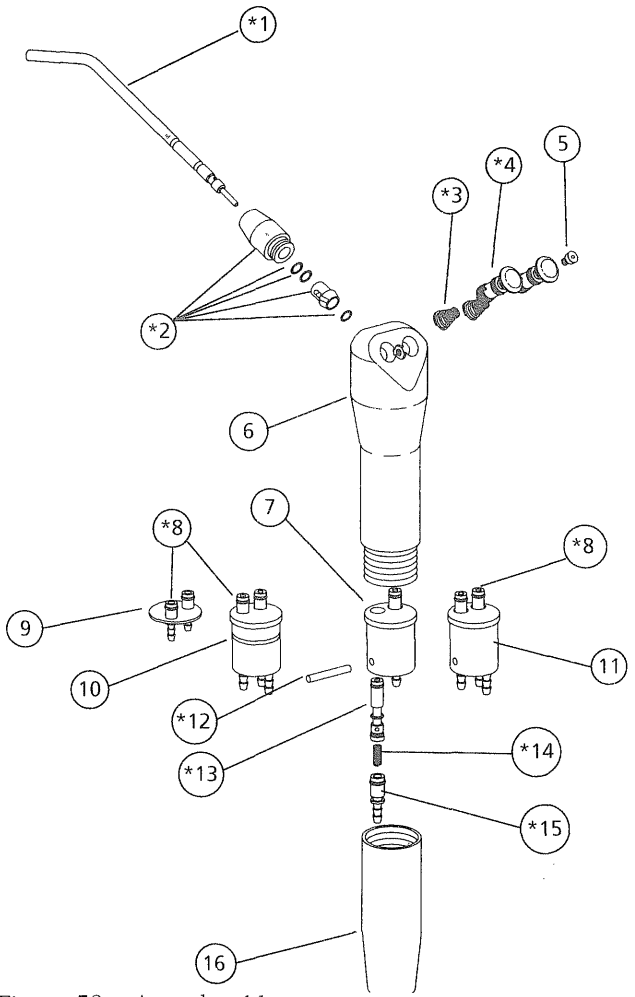


Figure 59. Autoclavable syringe

Ref. No.	Description	Part No.
*1	Syringe Tip, Autoclavable (2)	23.0872.00
*2	Nut Assembly, Syringe, Smooth	23.1112.00
*3	Conical Spring (2), Light	013.064.00
*4	Valve Assembly with O-rings (2)	23.1098.00
*5	Screw	23.1193.00
6	Syringe Head	---
7	Terminal Assembly w/stem, 2 Barb, QD	23.1067.00
*8	O-ring, Special (2)	035.025.00
9	Terminal Barb	23.1110.00
10	Terminal Barb, 3 Barb, Non-QD	23.1185.00
11	Terminal Assembly w/stem, 3 Barb, QD	23.1066.00
*12	Pin, Straight	011.038.00
*13	Stem Assembly with O-rings (2)	23.1064.00
*14	Spring (2), Heavy	013.003.00
*15	Terminal Barb Assembly with O-rings	23.1068.00
16	Nut, Autoclavable	23.1015.00
*	Service Kit	23.1099.00
	(Includes all items designated by an asterisk *.)	

Repair Instructions

Your syringe is designed to be easily serviced in the operatory. The syringe parts subject to wear under normal use are provided in your syringe service kit, located in the field repair kit.

If the Symptom is...	You should...	Refer to...
Leakage from under a button	Replace the valve assemblies.	Pg. 31
Leakage from the syringe tip	Replace the valve assemblies.	Pg. 31
Momentary spray of water from the syringe tip when the air is pressed	Make sure the tip is pushed all the way into the syringe. If the problem persists, replace the O-ring inside the tip retainer assembly or replace the tip retainer assembly.	Pg. 32
Leakage from syringe handle	Replace the O-rings on the connector tubes.	Pg. 32

Relieve System Air and Water Pressure

1. Disconnect the air supply. Use the syringe to bleed the system of air and water pressure.
2. Disconnect the syringe by turning the syringe handle, counterclockwise until the syringe head separates from the handle and tubing.

Replace Valve Assemblies

You will need a .050 hex key.

1. Using a .050 hex key, loosen the valve retaining screw (see Figure 60).
2. Carefully pull the valve assemblies, the retaining screw, and the springs out of the syringe head.
3. Lightly lubricate the outside of the O-rings on the new valve assemblies (see Figure 61) with the A-dec silicone lubricant supplied. Install the new valve assemblies and springs in the syringe head. Be sure the small end of the spring is toward the valve (see Figure 61).

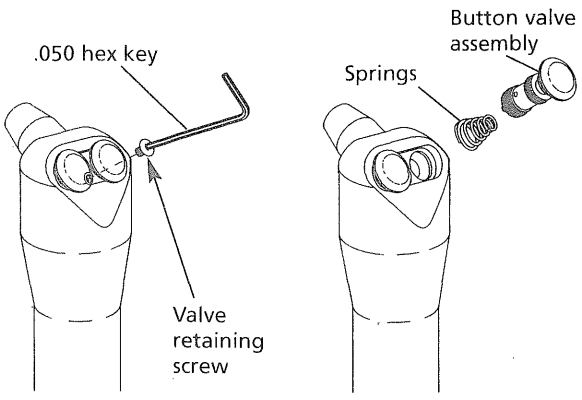


Figure 60. Remove the button valves.

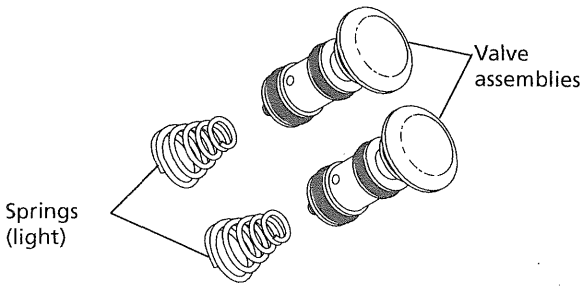


Figure 61. Install valve assemblies.

4. Press the valve assembly into the syringe head until the top of the brass spool is flush with the syringe head (see Figure 62).
5. Using the hex key, align the new valve retaining screw with the threaded hole in the syringe head, between the bottom of the button and the top of the brass spool of the valve assemblies (see Figure 62).

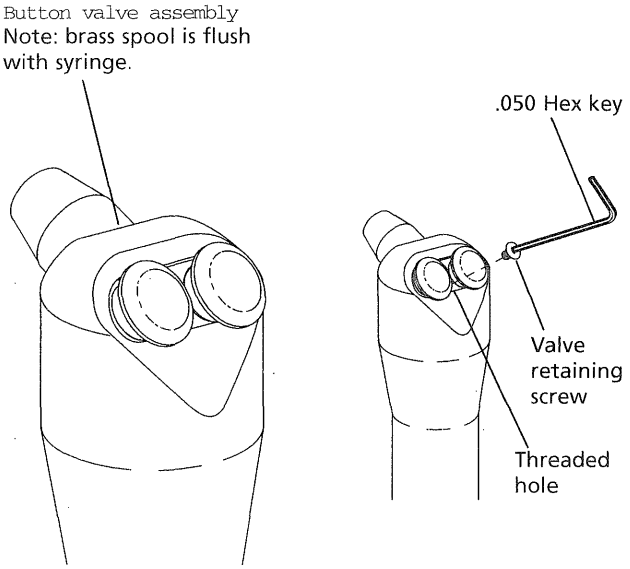


Figure 62. Install the button valves.

6. While holding the new valve retaining screw and hex key in place, use the tip of a small flat-blade screwdriver and gently press down on the brass spools of the valve assemblies until they are no longer flush with the syringe (see Figure 63).
7. Tighten the valve retaining screw into the syringe head. Do not overtighten the screw.
8. Connect the syringe to the dental unit. Reconnect the air supply. Check the syringe for proper air, water, and spray functions.

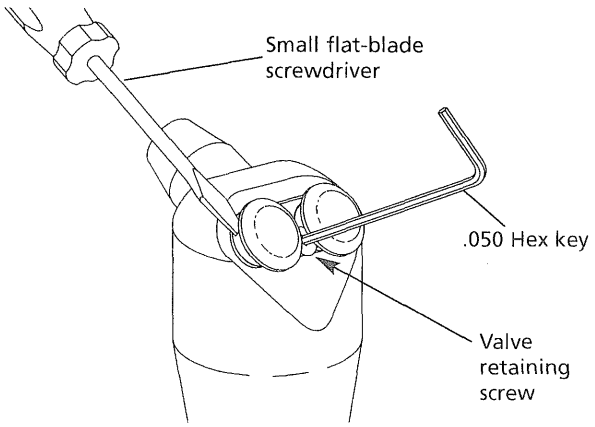


Figure 63. Tighten the valve retaining screw.

Replace the Syringe Tip Retainer O-rings

You will need a 5/32" hex key.

1. Relieve system air and water pressure (refer to page 31).

CAUTION

Use only A-dec silicone lubricant on syringe assembly O-rings. Petroleum based lubricants will damage autoclavable O-rings, causing syringe malfunction.

Use only the O-rings included in this kit. These O-rings are autoclavable. Autoclavable and non-autoclavable O-rings are visually identical. Use of non- autoclavable O-rings will result in syringe malfunction when the syringe is autoclaved.

2. Remove the syringe tip.
3. Using a 5/32" hex key, remove the tip retainer assembly.
4. Install the new smooth syringe nut assembly (see Figure 64). Be sure that the smaller diameter O-ring is installed in the spacer cavity and the two larger diameter O-rings and spacer are in the nut. Tighten firmly with the hex key provided.
5. Connect the syringe to the dental unit. Install an A-dec syringe tip. Connect the air supply and check for proper air, water, and spray functions.

Replace the Terminal Barb O-rings

1. Relieve system air and water pressure (refer to page 31).

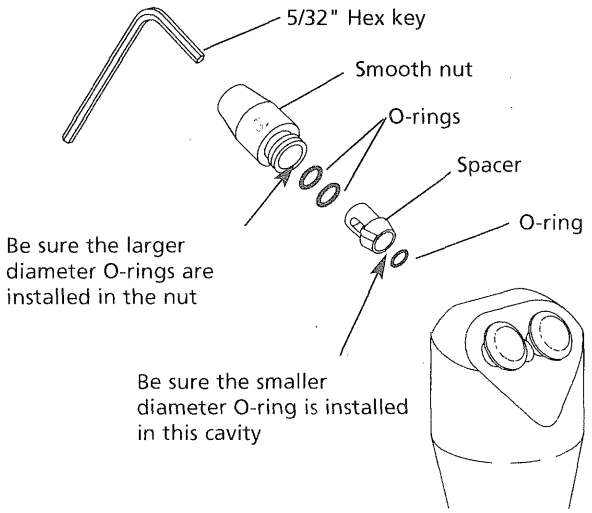

5/32" Hex key
Smooth nut
O-rings
Spacer
O-ring
Be sure the larger diameter O-rings are installed in the nut
Be sure the smaller diameter O-ring is installed in this cavity

Figure 64. Replace the smooth syringe nut assembly O-ring.

2. Remove and replace the terminal barb O-rings (see Figure 65) using the two O-rings in the syringe service kit.
3. Connect the syringe to the dental unit. Install an A-dec syringe tip. Connect the air supply and check for proper air, water, and spray functions.

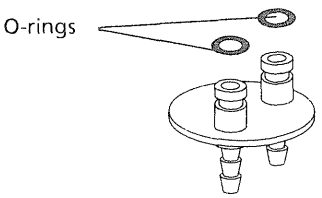


Figure 65. Replace the terminal barb O-rings.

Steril-Vac Service

Button Replacement

If air leakage develops around the AVS Oral Evacuator button, install a new button assembly. Your AVS Non-Locking Button Service Kit (10.0601.00) is in the Field Repair Kit. It contains the new button with O-rings, a spring, a tool for removing the old spring, and instructions for installing the new button.

AVS Supply Air Tubing Replacement

The supply air tubing for the AVS Oral Evacuator is inside the flexible drain tube (see Figure 66).

If the supply air tubing becomes crimped or develops a leak, install a new one as follows:

You will need an AVS Tubing Kit (order A-dec part no. 10.0645.00).

1. Separate the Steril-Vac from the Pac I at the quick disconnect.
2. Separate the flexible drain tube from the AVS Oral Evacuator handpiece and from the elbow on the waste container lid.
3. Unscrew the terminal nut from the AVS Oral Evacuator handpiece and disconnect the supply air tubing from the handpiece.
4. Remove the sleeve securing the supply air tubing to the elbow on the waste container lid and disconnect the supply air tubing form the elbow.
5. Discard the flexible drain tube, the supply air tubing, the sleeve and the terminal nut.
6. Connect the new supply air tubing to the AVS Oral Evacuator handpiece, and tighten the terminal nut.
7. Push the flexible drain tube onto the AVS Oral Evacuator handpiece.
8. Lay the tubing in a straight line, without stretching or compressing the flexible drain tube.
   - Mark the supply air tubing at the point where the flexible drain tube ends.
   - Cut the supply air tubing 1" (25mm) short of the mark.
9. Slide the sleeve, from the kit, on the supply air tubing. Push the tubing onto the elbow on the waste container lid. Secure the connection by sliding the sleeve over the tubing and barb.
10. Push the flexible drain tube onto the elbow.
11. Reconnect the Steril-Vac to the Pac I at the quick disconnect, and check for leaks at the tubing connections.

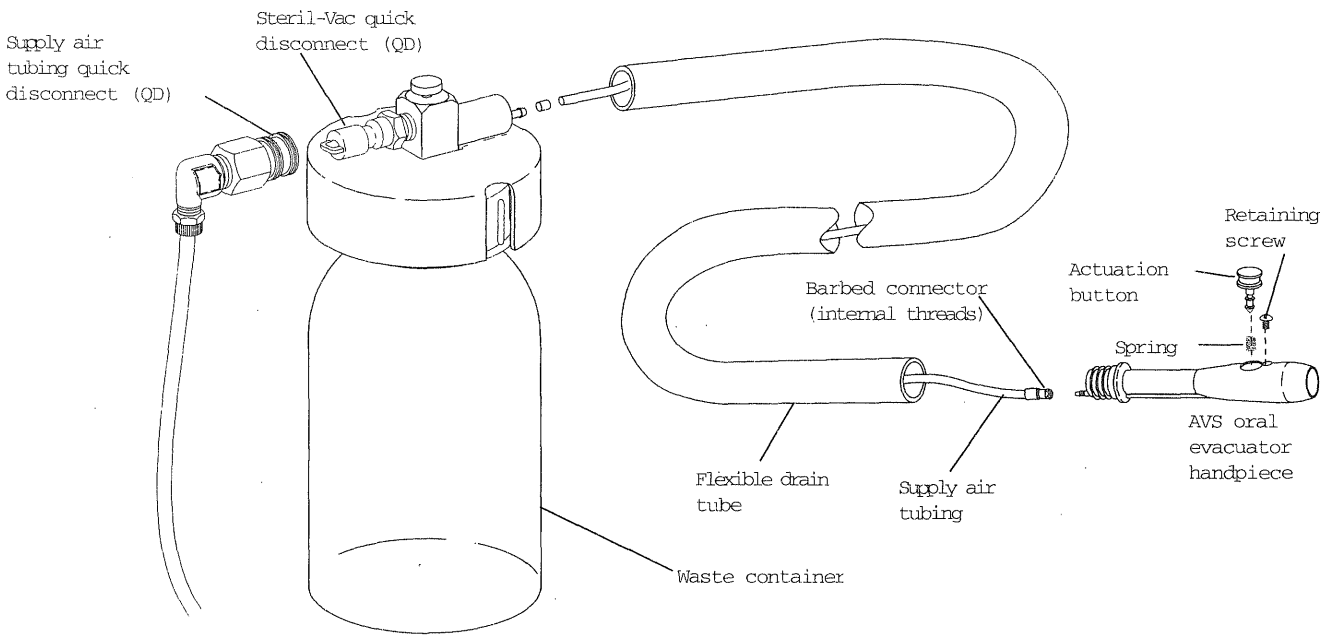


Figure 66. AVS Supply Air Tubing

PAC 1 TOOL AND REPAIR KITS

Field Repair Kit P/N 45.0439.00:

AVS Non-Locking Button Service Kit, P/N 10.0601.00
- 10.0109.00 Non-Locking On-Off Button Assembly
- 10.0440.00 Compression Spring
- 85.0040.00 Install AVS Button Kit
- 98.0030.00 Spring Removal Tool

Autoclavable Syringe Service Kit, P/N 23.1099.00
- 008.003.00 Hex Key, .050
- 008.006.00 Hex Key, 3/32
- 008.010.00 Hex Key, 5/32
- 011.038.00 Pin, Straight
- 013.003.00 Spring, Compression (2)
- 013.064.00 Spring, Conical (2)
- 030.002.00 O-ring
- 030.004.00 O-ring (4)
- 035.025.00 O-ring, Special (2)
- 23.0872.00 Syringe Tip (2)
- 23.1064.00 Stem Assembly, w/O-ring (2)
- 23.1068.00 Terminal Barb w/O-ring Assembly (2)
- 23.1098.00 Valve Assembly w/O-ring (2)
- 23.1112.80 Smooth Syringe Nut Assembly
- 23.1193.00 Screw, 2-56, Syringe
- 85.0435.00 Install, Syringe Service
- 85.0938.00 Card, Autoclave O-ring
- 85.0974.00 Card, Lubrication
- 98.0090.00 Lubricant, Silicone

Air Filter/Regulator Service Kit, P/N 90.1066.00
- 85.0136.00 Install, Air and Water Filter/Reg.
- 97.0402.00 Diaphragm/poppet, PAC1 fltr-reg
- 97.0404.00 Spring, PAC1 fltr-reg
- 97.0401.00 Filter Element

Foot Control III Service Kit, P/N 90.0593.00
- 013.011.00 Helical Comp. Spring
- 030.012.00 O-ring
- 10.0440.00 Compression Spring
- 22.0060.00 Poppet, Plastic, Foot Control
- 22.0580.00 Spr, Comp, .312 OD x .25
- 22.0778.00 Stem w/O-rings, Signal Relay Valve
- 38.0054.00 Diaphragm
- 38.0760.00 Piston, FC3, Assy
- 85.2832.00 Install, FC3 Repair
- 98.0090.00 Lubricant, Silicone

Century II Service Kit, Pac I, P/N 90.0043.00
- 002.097.00 Button Head Screw (4)
- 003.078.00 Socket Head Screw (2)
- 004.005.00 Flat Nylon Washer (10)
- 011.038.00 Straight Pin (2)
- 013.025.00 Helical Comp. Spring
- 022.029.00 Nut w/Sleeve, 1/4 ID (3)
- 023.001.00 Barb 1/4 (3)
- 023.004.00 Barb, 1/8 (5)
- 025.007.01 1/8 Uni-Clamp (pkg of 10)
- 025.015.01 Sleeve Clamp, 1/4 ID (pkg of 10)
- 030.001.00 O-ring (4)
- 030.004.00 O-ring (4)
- 29.0830.00 Stem w/O-rings (3)
- 29.0831.00 Stem with O-ring (1)
- 33.0036.01 Lever, Toggle Valve, Momentary, Gray
- 33.0106.00 Stem with O-ring Micro Selector Valve
- 38.0054.00 Diaphragm (2)
- 38.0179.00 Diaphragm (2)
- 38.0186.00 Gasket (3)
- 85.0096.00 Install, 2 & 3 way Control Valves
- 85.0353.00 Install, Cent. II, PAC 1, Service
- 98.0090.01 Silicone Lubricant (pkg of 6)

Miscellaneous
- 023.019.00 1/8" Inline Barb
- 049.004.00 Bottle Brush, 3/4" Dia
- 11.0230.00 White, Disposable Tip
- 23.0872.01 Syringe Tip (pkg of 5)
- 98.0090.01 Silicone Lubricant (pkg of 6)

Tool Kit PAC I, P/N 45.0438.00:
- 98.0072.00 Sleeve Tool (Plastic)
- 009.018.00 Hex Wrench Set
- 009.028.00 Phillips Screw Driver, 3/16 x 3" Shaft
- 009.029.00 Adjustable Wrench, 6"
- 054.030.01 Plastic, Molded Case, White

Agency Symbols

Identification of Symbols

c UL us UL 2601-1 C22.2,No. 601.1	Recognized by Underwriters Laboratories Inc.® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Recognized with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1	CE	Conforms to European Directives (refer to Declaration Statement)
			Protective earth (ground)
c UL us LISTED	UL listed to US (UL 544) and Canadian (CAN/CSA C22.2, No. 125) safety standards		Functional earth (ground)
			Attention, consult accompanying documents
CLASSIFIED c UL us UL 2601-1 C22.2,No. 601.1	Classified by Underwriters Laboratories Inc. with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Classified with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1		Type B applied part
			Class II equipment

Classification of Equipment (EN 60601-1)

Types of shock protection:

Class I Equipment
(Dental Chairs, Dental Lights, & Power Supplies)

Class II Equipment
(Chair, Wall, & Cart-Mounted Delivery Systems)

Degree of shock protection:

Type B Applied Part
(Delivery Systems Only)

Degree of protection against water ingress:

Ordinary Equipment
(All products)

Mode of operation:

Continuous Operation
(All models except Dental Chairs)

Continuous Operation with Intermittent Loading
(Dental Chairs -5% duty cycle)

Environmental

For Storage:	All equipment (except dental furniture)
Temperature:	-40°C to 70°C -40°F to 158°F
Relative Humidity:	95% maximum
For Operation:	
Temperature:	10°C to 40°C 50°F to 104°F
Relative Humidity:	95% maximum

Electromagnetic Compatibility

This equipment has been tested and found to comply with the limits for medical devices in EN60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation.
Contact A-dec Customer Service, if you have any questions.

Flammable Gasses

Not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide, where such gasses may accumulate in concentration (closed space).

Contact Information

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